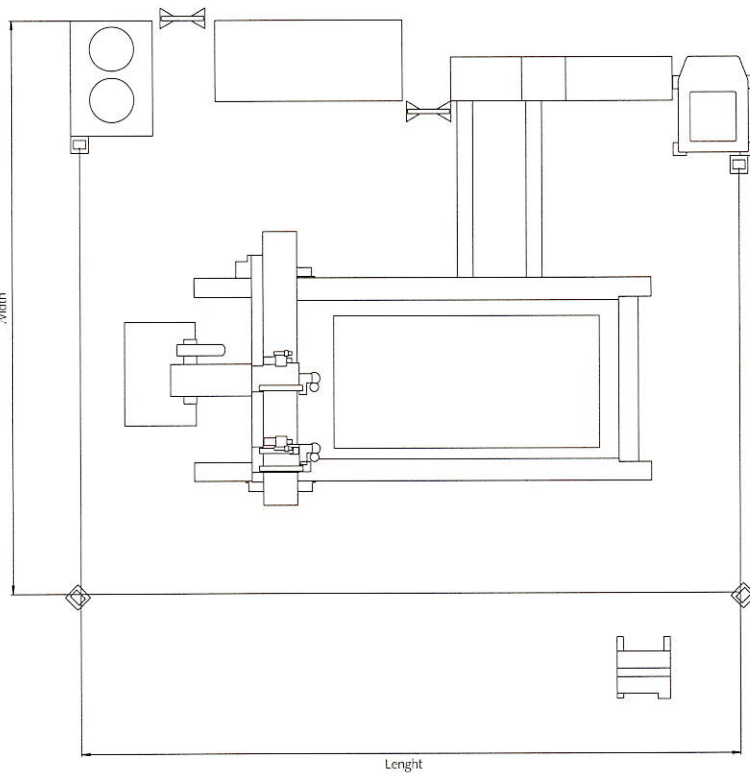
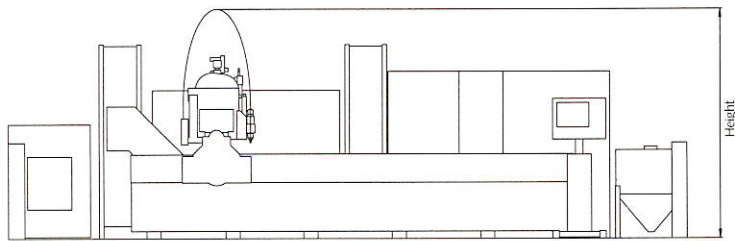


Technical data Byjet



	Byjet 3015	Byjet 4022
Length	7450 mm	8500 mm
Width	6500 mm	7200 mm
Height	2600 mm	2600 mm

WATERJET CREATIONS

BYSTRONIC BYJET 3015 DESCRIPTION / TECHNICAL DATA L60692

INTRODUCTION

BYSTRONIC is a manufacturer of state of the art laser and water jet cutting systems. All subassemblies such as HP (**H**igh **P**ressure) Pumps, CNC (**c**omputer **n**umeric **c**ontrol) controllers, programming software, handling equipment, etc. are developed and manufactured by BYSTRONIC. As a supplier BYSTRONIC assumes total responsibility.

MAIN FEATURES

The main features of the high-productivity Bystronic water jet cutting system are:

- Rigid, compact and user-friendly construction
- Extremely high travel speeds and cutting speeds
- Optimum accessibility from all sides thanks to narrow guide dimensions
- Automatic water level reduction (water level monitoring)
- Sophisticated automation using shuttle table
- A variety of further, possible automation modules can be added to customer needs for more productivity increase
- Reliable abrasive removal system
- Modular design enabling total lengths of up to 16m
- System expansion possible up to 4 abrasive cutting heads and multiple pumps
- CNC-controlled metering and monitoring of abrasive feed
- Simple conversion from abrasive to water-only cutting
- Watchdog / diagnostic facility on the machine and high-pressure pump for high process reliability and availability
- One or more CNC-controlled drill units and one CNC-controlled (tube) rotary axis with convenient user-friendly software, significantly increasing the flexibility of the overall system
- Easy-to-maintain high-pressure pump with direct pressure control (no time delay)
- Infinitely variable pressure regulation via CNC controller
- Increased productivity thanks to motorised, program-controlled adjustment of cutting-carriage distance control
- Powerful and user-friendly CAD / CAM system: Ultra-simple programming of parts and cutting plans
- All systems are upgradeable, even at a later date
- Custom systems are possible on request
- Low operating costs, thanks to modern ultra-high-pressure pump Bypump 50 APC and Byjet cutting head HPT with optimised cutting capacity

BASIC MACHINE

The Bystronic Waterjet cutting machine Byjet 3015 with working area 3m x 1.5m comprises the following components:-

- Machine frame with CNC-controlled automatic sludge removal and mechanical clamping device
- Cutting bridge with cutting carriage and tool axis with height and collision sensor
- Abrasive cutting module with CNC-controlled metering of abrasive
- Control cabinet module with CNC controller
- High-pressure pump
- Operating module with hand-held controller for setup tasks plus ergonomic operating console
- Set of tools, attachments and consumable parts
- Safety installation with light barriers

Machine frame

A rigid, single-section machine frame with high torsional strength ensures that drive and guide systems plus the material support are held with extreme accuracy. Even when operating at high speeds, the whole system is totally vibration free, guaranteeing maximum precision. Highest level of precision is thus ensured. The compact design means that the system is quick to install. All guide and drive systems are protected against dirt and damage by bellows and stainless steel cover panels.

All water-bearing components in the machine frame are made of stainless steel. The cutting basin is located between guide elements and is permanently fixed to the machine frame. The workpiece supports and the mechanical clamping devices ensure that the workpiece is held securely and accurately to deliver ultra-precise cuts. The sludge remover is installed in the lower section of the cutting basin, removing the cutting sludge continuously from the basin under CNC control to allow multi-shift operation.

Cutting bridge with cutting carriage and tool axis

The cutting bridge is made of high rigidity extruded aluminium and is designed for the extreme demands of totally vibration-free operation. The cutting bridge is fitted with rollers running on precision flat and profile guides on the machine frame. The cutting carriage (for multi-head machines) runs on precision linear guides on the cutting bridge, and is protected from dust and water by bellows.

The main axes are direct drive via a special synchronous belt drive, by ultra-modern high torque AC servomotors, ie. No intermediate gearbox. The drive design is completed by a rack-and-pinion combination adjusted for zero play.

On the cutting carriage is an abrasive cutting module as well as a tool axis, which serves for fitting the cutting head and the corresponding cutting carriage distance controller.

The compact and quick-closing cutting head is located on a spindle-driven, CNC-controlled tool axis. The workpiece surface is sensed via a slip ring (periodic sensing also possible) to maintain optimum separation between water outlet and workpiece. This means that practically "unattended manufacture" is possible even for curved materials whilst maintaining the highest cutting quality.

BYSTRONIC BYJET 3015 TECHNICAL DATA

MACHINE DATA

Technical data

Feature	Technical Data
Working area (with one cutting head)	3000 x 1500mm
Maximum stroke of tool axis	250 mm
Machine accuracy as per VDI / DGQ 3441	± 0.1 mm/m
Repeatability	± 0.05 mm
Simultaneous Positioning Speed X/Y axes	84 m/min
Maximum Cutting Speed	50 m / min
Weight / space requirement of Complete System	see layout plan
Maximum Material Thickness that can be placed on Table	200 mm
Maximum load per grating batten (standard / grating)	100 kg
Maximum Weight that can placed on Frame	4.0 T pro metre
Maximum load per grating batten (reduced back splash)	60 kg
Number of grating battens included as standard	30
Maximum workpiece weight, flat part	3200 kg
Maximum possible number of Grate Bars	70
Maximum Material Thickness that can be clamped	40 mm
Recommended Foundation Thickness	300 mm
Floor Load	0.8 N/cm ²
Floor Evenness over 5M	± 5 mm

Second Abrasive Tool, complete

Working area	3000 x 1170 mm
Minimum / Maximum head distance	330 mm / 1120 mm

Automatic water lowering

Max. level difference	200 mm
Lowering time for water	35 sec (200 mm)
Raising time for water	35 sec (200 mm)

Shuttle Table

Table size	3000 x 1500 mm
Maximum workpiece height	100 mm
Maximum cycle time	4 min
Positioning accuracy (table)	± 0.3 mm
Maximum workpiece weight flat parts (machine)	3200 kg
Maximum workpiece weight flat parts (shuttle table)	1600 kg / cutting table

Byloader

Maximum plate size	3000 x 1500 mm
Maximum workpiece height	50 mm
Maximum workpiece weight, flat part	640 kg
Foundation / Machine size	According to layout plan

Rotary Axis

Maximum tube length (with tailstock)	2700 mm
Maximum theoretical diameter with centres	200 mm
Maximum theoretical diameter with special clamping jaws (supplied by customer)	500 mm
Maximum workpiece weight, round part	500 kg
Positioning tolerance, rotary axis	$\pm 0.03^\circ$
Maximum mass moment of inertia of workpiece	3 kgm ²

Drilling Axis

Drill diameter	3 mm
Maximum drilling depth	70 mm
Nominal speed	2600 rpm

Manual Cutting Head chamfer – angle adjustment unit

Adjustment range on cutting carriage 1	0 to - 45° (clockwise)
Adjustment range on cutting carriage 2	0 to +45° (counter clockwise)
Cutting range limit in Y-direction for a tilted cutting head	Cutting carriage 1: 130 – 1970 mm Cutting carriage 2: 250 – 2100 mm
General conditions	The chamfer angle adjustment cannot be combined with the option – drilling axis
Positioning accuracy	Approx. + / - 0.5°

WATER CONNECTIONS**Inlet Water – high-pressure pump**

Minimum – maximum connection pressure (dynamic, for open line)	1 bar
Max. consumption, at the inlet of the pump	8 – 10 l/min
Connection diameter	16 mm

If supply pressure exceeds 6 bar, a pressure relief valve must be installed.

Inlet Water – high-pressure pump

Please talk to our technical staff before installing a water treatment system. The warranty is only valid if the fresh water supply to the pre-filter meets the criteria listed below.

Key Factors	Minimum Requirements	Ideal Conditions
Total water hardness ¹	Max. 5° dH	1° to 3° dH
pH-value	6.5 to 7.5	7,0
Proportion of all dissolved substances ²	10 – 75 mg/l	15 mg/l
Iron and manganese (Fe & Mn)	< 1 mg/l	0 mg/l
Alkali content (CaCo ³)	20 mg/l	0 mg/l
Siicon and silicon oxide (Si&SiO ₂)	15 mg/l	0 mg/l
Chlor ³	1 mg/l	0 mg/l
CA & Mg (total hardness)	17 mg/l	0 mg/l
Bacteria ⁴	100 col.	0 col.

1 17.8 PPM CaCo₃ = 1° dH = 1.75 fH

2 It is essential to keep this content above 10 mg/l

3 The chlorine content must equal 0 mg/l if a reverse osmosis system is used

4 Only required if a mixed-bed ion exchanger is planned

Please note that most water works change their water supply sources according to need and / or season. This as well as other factors can lead to severe changes in your water quality. This should be taken into account in the planning and selection of a water treatment system.

If you are installing a new piping system, PVC or plastic pipes are preferable because copper and iron pipes increase the dissolved substances content of the water.

Note: Water becomes more corrosive when impurities are removed. Excessive water treatment can thus be damaging to components in the high-pressure water system. It is essential that the content of all dissolved substances in the water lies above 10 mg/l. The correct water quality has a major impact on the operating life of all the high-pressure components.

Before commissioning the cutting machine, the customer must perform a suitable water analysis. Laboratory analysis of the water must be performed immediately after the sample has been taken. Bystronic must be informed of the analysis results prior to commissioning the system.

Water – drill unit

Inlet pressure	ca. 5 bar
Consumption	ca. 1 dl/min
Connector dimension	¼ inch

Overflow System

Hose connection diameter, machine	25 mm
Hose connection diameter, pump	10 mm

Water runoff system

Hose connection diameter	50 mm
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Water runoff – shuttle table

Hose connection diameter	18 mm
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COMPRESSED AIR CONNECTIONS

All consumption values at 20 °C and 6 bar pressure

Machine

Compressed air quality	Oil and Water Free
Minimum inlet pressure	6 bar
Hose connection diameter	1/2 inch
Maximum consumption machine	5 m ³ /h
Maximum consumption drill spindle (single tool)	32 m ³ /h
Maximum consumption pneumatic abrasive-delivery system (single tool)	11 m ³ /h

High-pressure pump

Minimum inlet pressure	6 bar
Hose connection diameter	8 mm
Maximum consumption	1 m ³ /h

ELECTRICAL SUPPLY (MACHINE, PUMP AND COOLING UNIT)

	(with oil / air cooler)
Connection	3 Phase & PE
Mains frequency	50 Hz / 60 Hz
Supply voltage	3 x 400 V / 4 x 480 V
Maximum supply voltage tolerance	+ 6% / - 10%
Fuse	125 AT
Max. active power	65 kVA
Max. nominal power	39 kW
Cos (Φ)	0.78
The power supply should be free of high-frequency interference (spikes), which can be produced for example by spot welding machines, etc.	
Operating a second high pressure pump doubles the connected load. This can be made either centrally or per pump.	

MAXIMUM DISTANCES BETWEEN THE INDIVIDUAL AGGREGATES

Maximum distance between control cabinet and machine / shuttle table	10 m
Maximum distance between control cabinet and operating console	9 m
Maximum distance between control cabinet and high-pressure pump	15 m
Maximum distance between control cabinet and cooling unit	20 m
Maximum distance between high-pressure pump and cooling unit	10 m
Maximum distance between control cabinet and netbox (compact router, interface box to customer network)	50 m
Maximum distance between netbox and customer PC	90 m

The specified distances are the result of maximum cable lengths (signal transmission). The distances are measured from the centre of the surrounding rectangles. Greater distances are available upon enquiry.

ADDITIONAL DATA ON BYSTRONIC

High-pressure pump model, Bypump, Type 50 APC

Maximum dynamic pressure	3800 bar
Working pressure with two cutting heads (0.28 mm sapphire nozzle)	400 - 3600 bar
Flow rate at 3600 working pressure	0 – 5.0 l/min
Maximum nozzle size in single-head operation	1 x 0.40 mm
Maximum nozzle size in two-head operation	2 x 0.30 mm
Recommended nozzle size in two-head operation	2 x 0.28 mm
Hydraulic fluid (mineral oil ISO-VG 46 DIN 51524)	ca. 280 l

ABRASIVE DELIVERY

Abrasive delivery to cutting head *	0-600 g/min
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* approximate values measured for a type 80 abrasive. Different abrasive qualities and particle sizes require different settings.

AMBIENT CONDITIONS

Feature	Limit Value
Minimum ambient temperature (operation)	15 °C
Maximum ambient temperature (operation)	35 °C *
Maximum relative humidity	95 %
Dew point	< 10 °C **

* In case of workshop temperatures above 35 °C, Bystronic must be consulted. Direct solar radiation on the machine is not permitted.

** The dew point of the surrounding air must lie below 10°C, in order to avoid formation of condensed water on cooler parts of the machine

BUILDING REQUIREMENTS (FOUNDATION)

Feature	Value
Floor load-resistance	0.8 – 1.0 N/cm ²
Recommended foundation thickness (reinforced)	300 mm (depending upon construction ground, more)
Concrete quality	B35/25; PC 300 kg/m ³
Differential settlement	Max. 0.1 mm/m
Floor flatness	± 5 mm over 5m
Natural frequency of the floor	≥ 30 Mz

All energy supply and preparations according to machine diagram and "Installation" item must be provided by the customer.