



## S2U IP66

Variable Frequency Drive



PRODUCTS &  
SOLUTIONS



## Variable frequency drive: the ideal drive for your lean application projects

Bonfiglioli S2U IP66 drives are designed to be fast to install.

Compact and cost effective, S2U IP66 is suitable for a wide range of machinery applications requiring extreme conditions such as dust, moisture and cleaning chemicals.

S2U IP66 range is made of 3 frame sizes and kW rating from 0.4 kW up to 18.5 kW.

The integrated Keypad makes setup and commission easier.

Thanks to its integrated PLC functions and Ladder language complying with standard IEC61131, S2U IP66 allows the machines to be customised.

Moreover, it can be easily integrated into any control architecture thanks to the built-in Modbus port and the wide range of standard communication configuration protocols available.

Easy Plug in of PC Vplus with S2U Manager is granted via the integrated RJ45 connector for high level commissioning.



# Mechatronics - The **Challenge** to build **your Success**

## **Faster, better and cheaper - this is the new challenge for machine designers!**

Increasing demands regarding the productivity of complex system machines, and thus more flexible machines which run at highest efficiency levels, now require new intelligent technical solutions that enhance future growth.

Bonfiglioli has implemented a detailed strategy to precisely achieve this objective!

Mechatronic Drives & Solutions division is born with the mission to improve profitability by acting as a reliable partner and a provider of energy-efficient solutions over the total lifecycle in the field of industrial automation.



SYSTEM  
INTEGRATION



EXPERTISE



ENERGY  
SAVINGS

## Type of applications

- High environmental immunity
- High braking ability without braking resistor
- High torque at low speed
- Heat sink designed for dusty environments



PACKAGING  
INDUSTRY



FANS, PUMPS  
AND MIXERS



TEXTILE  
MACHINES



MATERIALS  
HANDLING



WOOD  
PROCESSING



FOOD,  
BEVERAGE &  
TOBACCO

# Designation

## S2U IP66 series

### Basic variants



S2U

400

T

-

21

F

**Noise filter**  
 F Built-in  
 (blank) None

**Power**  
 03 0.4 kW  
 07 0.75 kW  
 11 1.5 kW  
 13 2.2 kW  
 18 3.7 kW  
 19 5.5 kW  
 21 7.5 kW  
 23 11 kW  
 25 15 kW  
 27 18.5 kW

**Phase number**  
 S Single phase  
 T Three phase

**Supply**  
 230 200-240 V  
 400 380-480 V

**Series**  
 S2U inverter S2U

## Features

- Sensorless Vector and V/f control
- Motor Auto-tuning function
- Integrated braking transistor for all series
- RTU Modbus RS485 interface through RJ45
- 150% starting torque at 1 Hz
- Carrier frequency: 1~16 kHz
- Firemode
- Accl.and Decel. Control: 4 S curve setting
- 16 preset speeds
- Buil-in PID controller
- Pulse train frequency reference
- Emergency stop function built-in complying with global standard
- Internal PLC functions with Ladder language
- 32 bit CPU
- Integrated EMC filter
- Torque compensation
- Slip compensation

## Features



	Features	Benefits
<b>Performance</b>	32 bit Processor with advanced IGBT power switching frequency.	Advanced and accurate sensorless vector control providing high starting torque at low speed.
<b>Intelligence</b>	Built-in PLC functions and PID controller.	Provide accurate control and regulation for frequency, Pressure, Air volume in applications such as HVAC without PLC Programming.
<b>Robustness</b>	IP66 degree protection version rating up to 18.5 kW	Suitable for harsh environment protecting machine from high Pressure water jets from any direction.
<b>Reliability</b>	Built-in EMC filter in compliance with IEC/EN61800-3	Lower electromagnetic interference allowing a safe machine environment.

## General technical data

### 200 V Class: Single phase

Model: S2U230S-□□ F IP66	03	07	11	13
Suitable motor capacity [kW]	0.4	0.75	1.5	2.2
Rated output current [A]	3.1	4.5	7.5	10.5
Rated capacity [KVA]	1.2	1.7	2.90	4.00
Input voltage range [V]	Single Phase: 200~240 V, 50/60 Hz			
Allowable voltage fluctuation	+10%-15%			
Output voltage range [V]	Three phase: 0~240 V			
Input current [A]*	8.5	12	16	23.9
Inverter net weight [kg]	1.65	1.65	2.5	2.5
Allowable momentary power loss time [s]	2.0	2.0	2.0	2.0
Enclosure	IP20/NEMA1&IP66/NEMA4X			

\* The input current is calculated value at full rated output current.

### 400 V Class: Three phase

Model: S2U400T-□□ F IP66	07	11	13	18
Suitable motor capacity [kW]	0.75	1.5	2.2	3.7
Rated output current [A]	2.3	3.8	5.2	8.8
Rated capacity [KVA]	1.7	2.9	4.0	6.7
Input voltage range [V]	Three phase: 380~480 V, 50/60 Hz			
Allowable voltage fluctuation	+10%-15%			
Output voltage range [V]	Three phase: 0~480 V			
Input current [A]*	4.2	5.6	7.3	11.6
Inverter net weight [kg]	1.7	1.7	2.5	2.5
Allowable momentary power loss time [s]	2.0	2.0	2.0	2.0
Enclosure	IP20/NEMA1&IP66/NEMA4X			

\* The input current is calculated value at full rated output current.

### 400 V Class: Three phase

Model: S2U400T-□□ (F) IP66	19	21	23	25	27
Suitable motor capacity [kW]	5.5	7.5	11	15	18.5
Rated output current [A]	13.0	17.5	24	32	40
Rated capacity [KVA]	9.9	13.3	19.1	24	30.5
Input voltage range [V]	Three phase: 380~480 V, 50/60 Hz				
Allowable voltage fluctuation	+10%-15%				
Output voltage range [V]	Three phase: 0~480 V				
Input current [A]*	17	23	31	38	48
Inverter net weight [kg]	6.7	6.7	6.7	13.7	13.7
Allowable momentary power loss time [s]	2.0	2.0	2.0	2.0	2.0
Enclosure	IP20/NEMA1&IP66/NEMA4X				

\* The input current is calculated value at full rated output current.



# General technical data

## IP66 / NEMA 4X Type

Model	Supply voltage (Vac)	(kW)	Filter	Switch	Frame Size
S2U230S-03 F IP66	1 ph 200~240 V +10%-15% 50/60 Hz	0.4	V	V	1
S2U230S-07 F IP66		0.75	V	V	1
S2U230S-11 F IP66		1.5	V	V	2
S2U230S-13 F IP66		2.2	V	V	2
S2U400T-07 F IP66	3 ph 380~480 V +10%-15% 50/60 Hz	0.75	V	V	1
S2U400T-11 F IP66		1.5	V	V	1
S2U400T-13 F IP66		2.2	V	V	2
S2U400T-18 F IP66		3.7	V	V	2
S2U400T-19 F IP66		5.5	V	V	3
S2U400T-21 F IP66		7.5	V	V	3
S2U400T-23 F IP66		11	V	V	3
S2U400T-25 IP66		15	-	-	3
S2U400T-27 IP66		18.5	-	-	3

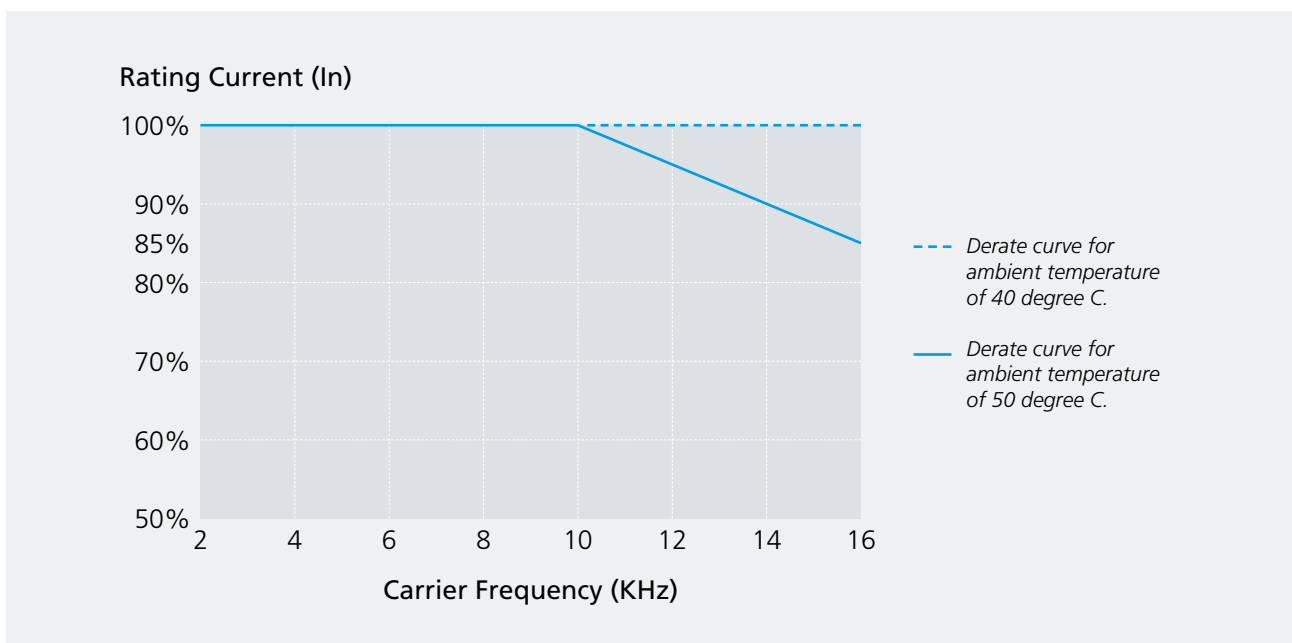
V: Built-in / - : None

## De-rating curves

Curves below show the applicable output current de-rate due to setting of carrier frequency and the ambient operating temperatures of 40 and 50 degrees C.

### Frame 1/2/3/4

(Single phase: 200 V: 0.4 ... 2.2 kW; Three phase: 400 V: 0.75 ... 18.5 kW)



## General technical data

<b>CE conformity</b>	The S2U frequency inverters meet the requirements of the low voltage directive 2006/95/EEC and DIN EN 61800-5-1.
<b>EMC directive</b>	For proper installation of the frequency inverter in order to meet the requirements of EN 61800-3, please comply with the installation instructions in these operating instructions.
<b>Interference immunity</b>	The S2U frequency inverters meet the requirements of EN 61800-3 for use in industrial environments.
<b>UL Approval</b>	The frequency inverters are also marked with the UL label according to UL508c, which proves that they also meet the requirements of the CSA Standard C22.2-No. 14.
<b>Ambient temperature</b>	Storage: -20 ... 60 °C (-4 ... 140 °F) Operation: -10 ... 50 °C (14 ... 122 °F) If several inverters are installed in the same Operator panel, ensure adequate spacing and provide the necessary cooling and ventilation for successful operation.
<b>Environmental conditions</b>	Operation: 3K3 (EN60721-3-3) Relative humidity: max 95%, no water condensation Notice prevention of inverter freezing up. (Compliance with IEC 60068-2-78).
<b>Ingress protection rating</b>	IP66
<b>Shock resistance</b>	1 G. (9.8 m/s <sup>2</sup> ) for 20 Hz and below 0.6 G (5.88 m/s <sup>2</sup> ) from 20 to 50 Hz (Compliance with IEC 60068-2-6)
<b>Storage</b>	Storage according to EN 50178 After one year of storage, connect the device to mains voltage for 60 minutes.

## General technical data

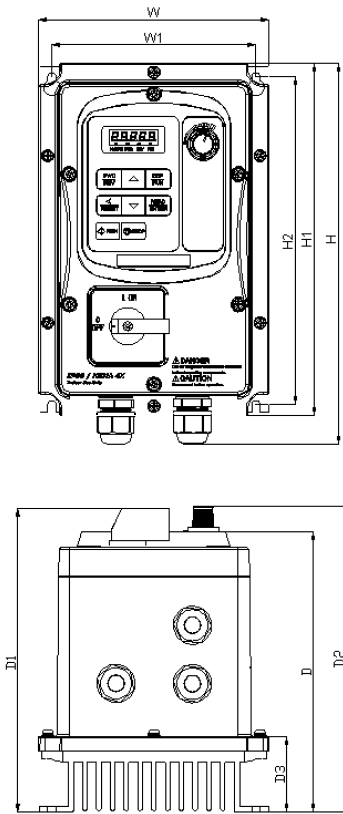
<b>Control Mode</b>		V/F Control, Vector Control
<b>Frequency</b>	<b>Output Frequency</b>	0.01~599.00 Hz
	<b>Starting Torque</b>	150% / 1 Hz (Vector)
	<b>Speed Control Range</b>	1:50
	<b>Setting resolution</b>	Digital input: 0.01 Hz Analog input: 0.06 Hz / 60 Hz
	<b>Setting</b>	Keypad: Set directly with ▲ ▼ keys or the VR on the keypad External Input Terminlas: AI1 (0/2~10 V), AI2 (0/4~20 mA) input Multifunction input up/down function(Group3) Setting frequency by communication method.
	<b>Frequency limit</b>	Lower and upper frequency limits 3 skip frequency settings.
<b>Run</b>	<b>Operation set</b>	Keypad run, stop button
		External terminals: Multi- operation-mode 2 / 3 wire selection Jog operation
		Run signal by communication method.
<b>Main Control Features</b>	<b>V / F curve setting</b>	18 fixed curves and one customized curve
	<b>Carrier frequency</b>	1~16 kHz
	<b>Acceleration and deceleration control</b>	2 off Acc / Dec time parameters. 4 off S curve parameters.
	<b>Multifunction input</b>	29 functions (refer to description on group 3)
	<b>Multifunction output</b>	21 functions (refer to description on group 3)
	<b>Multifunction analog output</b>	5 functions (refer to description on group 4)
	<b>Main features</b>	Overload Detection, 16 preset speeds, Auto-run, Acc/Dec Switch (2 Stages), Main/Alt run Command select, Main/Alt Frequency Command select, PID control, torque boost, V/F start Frequency, Fault reset, Firemode.

## General technical data

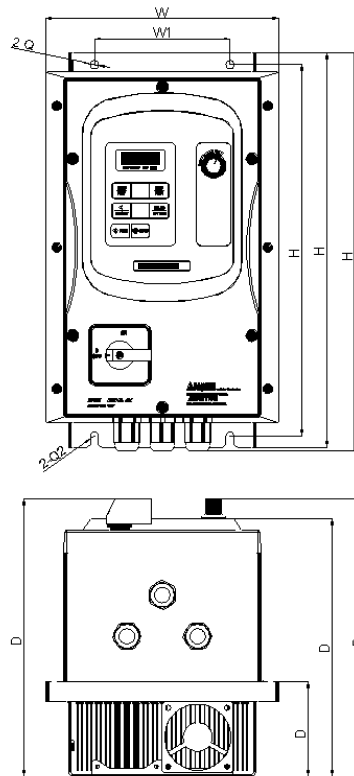
<b>Display</b>	<b>LED</b>	Display: parameter / parameter value / frequency / line speed / DC voltage / output voltage / output current / PID feedback / input and output terminal status / Heat sink temperature / Program Version / Fault Log.
	<b>LED Status Indicator</b>	Run / Stop / Forward / Reverse ,and etc.
<b>Protective Functions</b>	<b>Overload Protection</b>	The relays to protect the motor and the inverter. (150%/1min)
	<b>Over voltage</b>	220 V: >410 V, 380 V: >820 V
	<b>Under Voltage</b>	220 V: <190 V, 380 V: <380 V
	<b>Momentary Power Loss Restart</b>	Inverter auto-restart after a momentary power loss.
	<b>Stall Prevention</b>	Stall prevention for Acceleration/ Deceleration/ Operation.
	<b>Short-circuit output terminal</b>	Electronic Circuit Protection
	<b>Grounding Fault</b>	Electronic Circuit Protection
	<b>Other protection features</b>	Protection for overheating of heat sink. The carrier frequency decreasing with the temperature function, fault output, reverse prohibit, prohibit for direct start after power up and error recovery, parameter lock up
	All frames include brake transistor	
<b>Communication control</b>	Standard built-in RS485 communication (Modbus), One to one or One to many control.	

# Dimensions

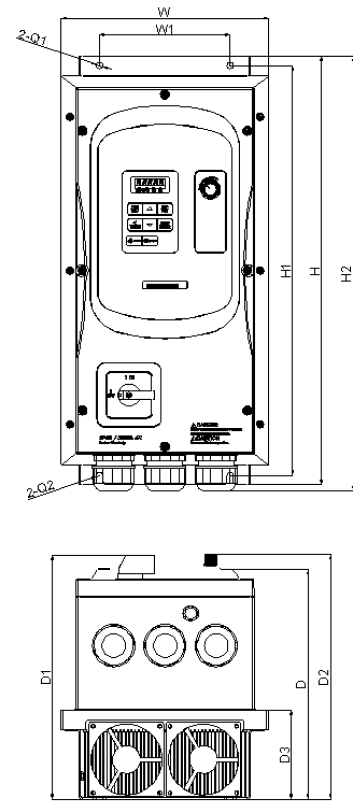
**Frame 1**  
(Weight: 2.9 kg)



**Frame 2**  
(Weight: 5.98 kg)



**Frame 3**  
(Weight: 12.68 kg)



Frame	W	W1	H	H1	H2	D	D1	D2	D3	Q1	Q2	Q3
[mm]												
1	150.8	133.3	248.7	230.2	214.2	183	200	200	49.5	5.4	5.4	10.6
2	198	115	337.9	335	315	218.4	235.2	235.2	79.8	7	7	5.98
3	222.8	140	466.3	460	440	246.6	266.5	263.5	96	7	7	12.68

# Global Presence



Bonfiglioli is a market force with a presence spanning 22 countries on 5 continents. Our organization makes the most of geographic proximity to offer complete solutions combining efficiency and competence.



4000  
EMPLOYEES



20  
BRANCHES



15  
PLANTS



550  
DISTRIBUTORS



80  
COUNTRIES

## We Are a Global Company

Thanks to an international network of sales branches and closely interconnecting production plants, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. Aware that our direct presence in local markets is the key to long-lasting success, our family includes 20 sales branches, 15 production plants and more than 500 distributors around the world.

**Our organization is always close by, offering complete and efficient solutions and supporting our customers with dedicated services, such as co-engineering or after-sales assistance.**



# Bonfiglioli Worldwide Locations

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 ASSEMBLY

 SALES

 SERVICE



We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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