

Affordable 3-litre PC for demanding tasks

The Shuttle XPC slim Barebone XH310R is a real roomster considering its small footprint - one optical drive, two 2.5" storage drives and an M.2 SSD card can be installed into the robust steel chassis. It supports the powerful Intel Core desktop processors with socket LGA1151v2. The built-in heatpipe cooling ensures the system runs quietly and reliable. Thanks to its great connectivity it meets the requirements of many applications that extends from office PC up to industrial applications. The system supports two displays with Ultra HD resolution, dual LAN, eight USB ports and up to five serial ports. With this high level of efficiency and flexibility - who needs a bulky tower PC anyway?

XPC slim Barebone XH310R

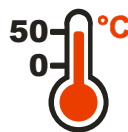


Images for illustration purposes only. The vertical stand and optical drive available separately.

Feature Highlights	
Slim-Design	<ul style="list-style-type: none"> • Slim 3.5-litre chassis, black • Dimensions: 23.8 x 20 x 7.25 cm (L/W/H) • Max. operating temperature: 0~50°C • Mainboard in Mini-ITX form factor (17 x 17 cm)
Processor	<ul style="list-style-type: none"> • Socket LGA 1151v2 supports Intel Core CPUs Gen. 8/9 "Coffee Lake", max. 65W TDP • Core i9/i7/i5/i3, Pentium Gold, Celeron [10] • Including heatpipe cooling system
Operating System	<ul style="list-style-type: none"> • This system comes without operating system. • Supports Windows 10/11 and Linux (64 bit)
Chipset	<ul style="list-style-type: none"> • Intel H310 Chipset
Memory	<ul style="list-style-type: none"> • 2x 260-pin SO-DIMM slots • Supports DDR4-2400/2666, max. 2x 32 GB
Graphics	<ul style="list-style-type: none"> • Integrated Intel UHD graphics • Supports two independent 4K displays
Drive Bays	<ul style="list-style-type: none"> • Bays: 2x 6.35cm/2.5" for hard disks or SSDs and 1x optical slimline drive • Connectors: 3x Serial ATA max. 6 Gbps, • Two pre-installed SATA cables (HDD+ODD)
Mini-Slots	<ul style="list-style-type: none"> • M.2 2280M Slot (supports SATA/PCIe SSD cards) • M.2 2230E Slot (supports WLAN-cards)
External Connectors	<ul style="list-style-type: none"> • HDMI 2.0a + DisplayPort 1.2 + D-Sub/VGA • 5.1 HD Audio (digital audio via HDMI/DP) • 4x USB 3.0, 4x USB 2.0 (each 2 front, 2 rear) • 2x Intel Gigabit LAN, 2x RS232 (1x RS422/RS485) • Connector for ext. power or Clear-CMOS button
Onboard Connectors	<ul style="list-style-type: none"> • USB 2.0, Embedded DisplayPort, LPC • Connector for 12V DC-Input • Allways-On-Jumper (Power-on-after-power-fail)
Optional Accessories	<ul style="list-style-type: none"> • Vertical stand (PS01), 3.5" HDD rack (PHD4) • VESA mount (PV02), WLAN kit (WLN-M) • Three additional COM ports (PCM31) • Adapter cable for ext. power button (CXP01)
Power Supply	<ul style="list-style-type: none"> • 90W/19V adapter (DC-input also supports 12V)

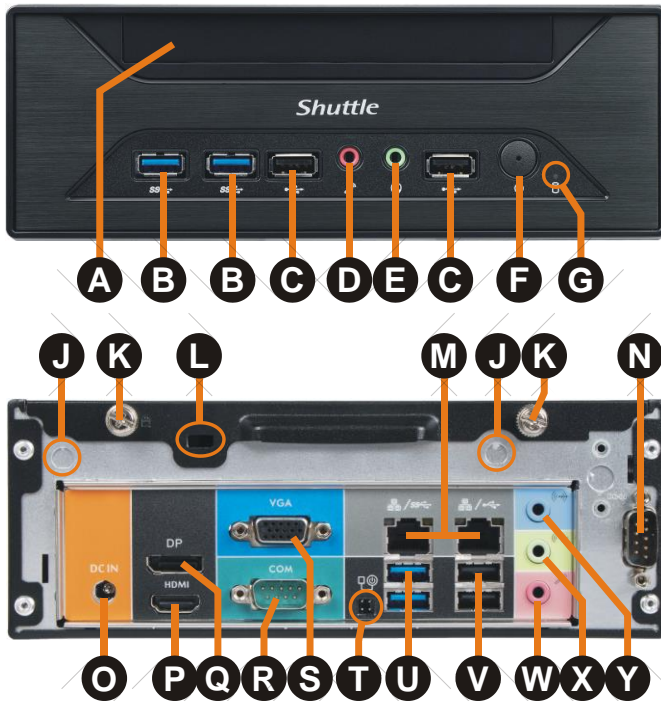


Supports 8th/9th Generation Intel Core Processors "Coffee Lake"



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Shuttle XPC slim Barebone XH310R – Front and Back Panel



Front Panel

- A 5.25" bay for optical slimline drive (DVD or Blu-ray)
- B 2x USB 3.0 port (= USB 3.1 Gen. 1)
- C 2x USB 2.0 port
- D Microphone input
- E Headphone output
- F Power on button with LED
- G LED indicator for hard disk activity

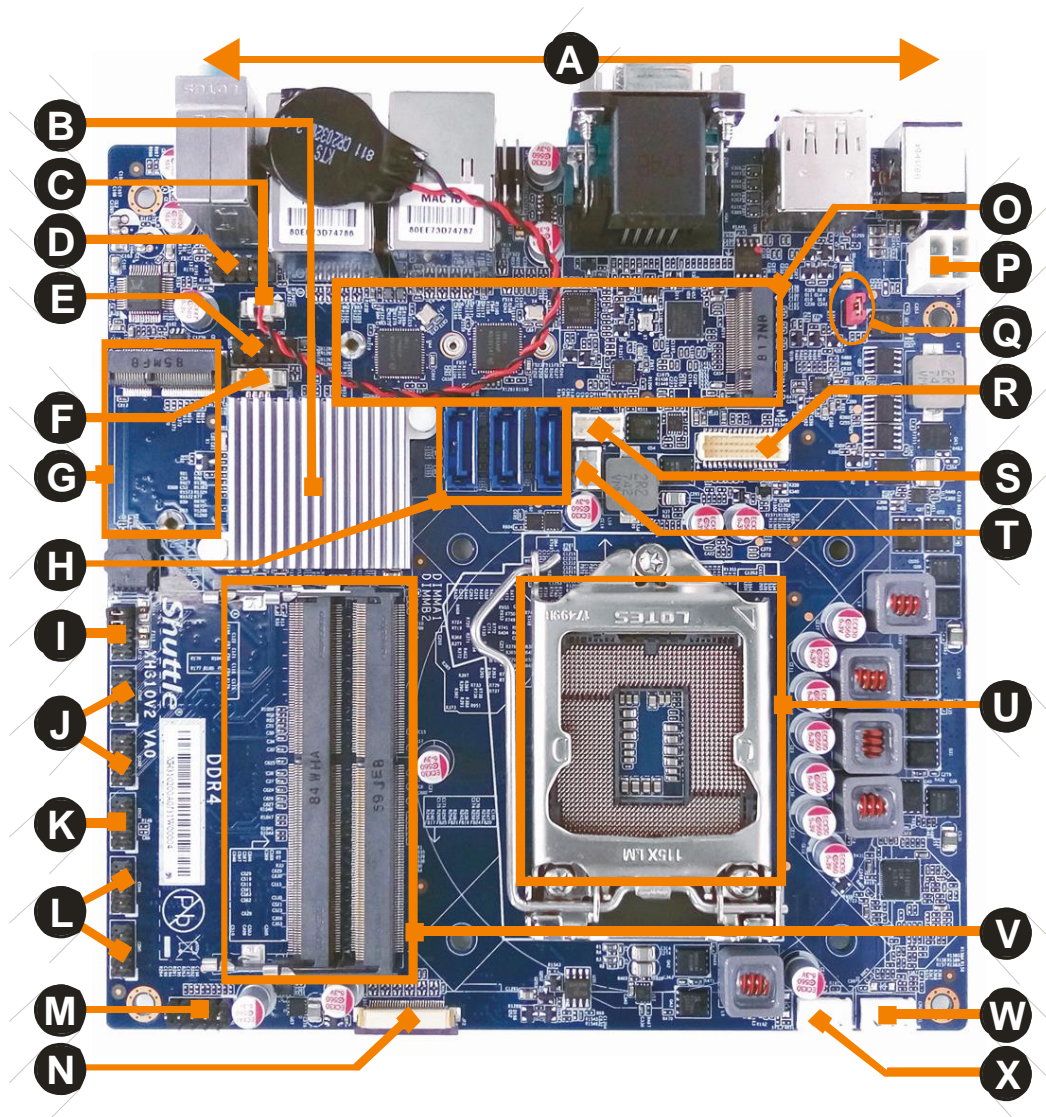
Back Panel

- J 2x perforation for optional WLAN antenna
- K 2x thumbscrew
- L Hole for Kensington Lock
- M Dual Gigabit network (RJ45)
- N RS232 serial interface (COM port)
- O DC-in Connector for power adapter
Supports 12V and 19V input voltage
- P HDMI 2.0a Video/Audio output
- Q DisplayPort 1.2 Video/Audio output
- R RS232/422/485 serial interface (COM port)
- S D-Sub/VGA Video output
- T Connector (4-pin, 2.54 mm pitch) for external power button, Clear CMOS and 5V DC voltage
- U 2x USB 3.0 (= USB 3.1 Gen. 1)
- V 2x USB 2.0
- W Microphone input
- X Headphone / line-out
- Y Audio line-in

Comparison of product versions:

	with open front	with front doors
Initial product version 2018 (until Q1'2019)	 XH310 UPC code: 887993001555	 XH310V UPC code: 887993001562
H310 chipset revision 2019 Same features, different drivers	XH310R UPC code: 887993001630	XH310RV UPC code: 887993001623

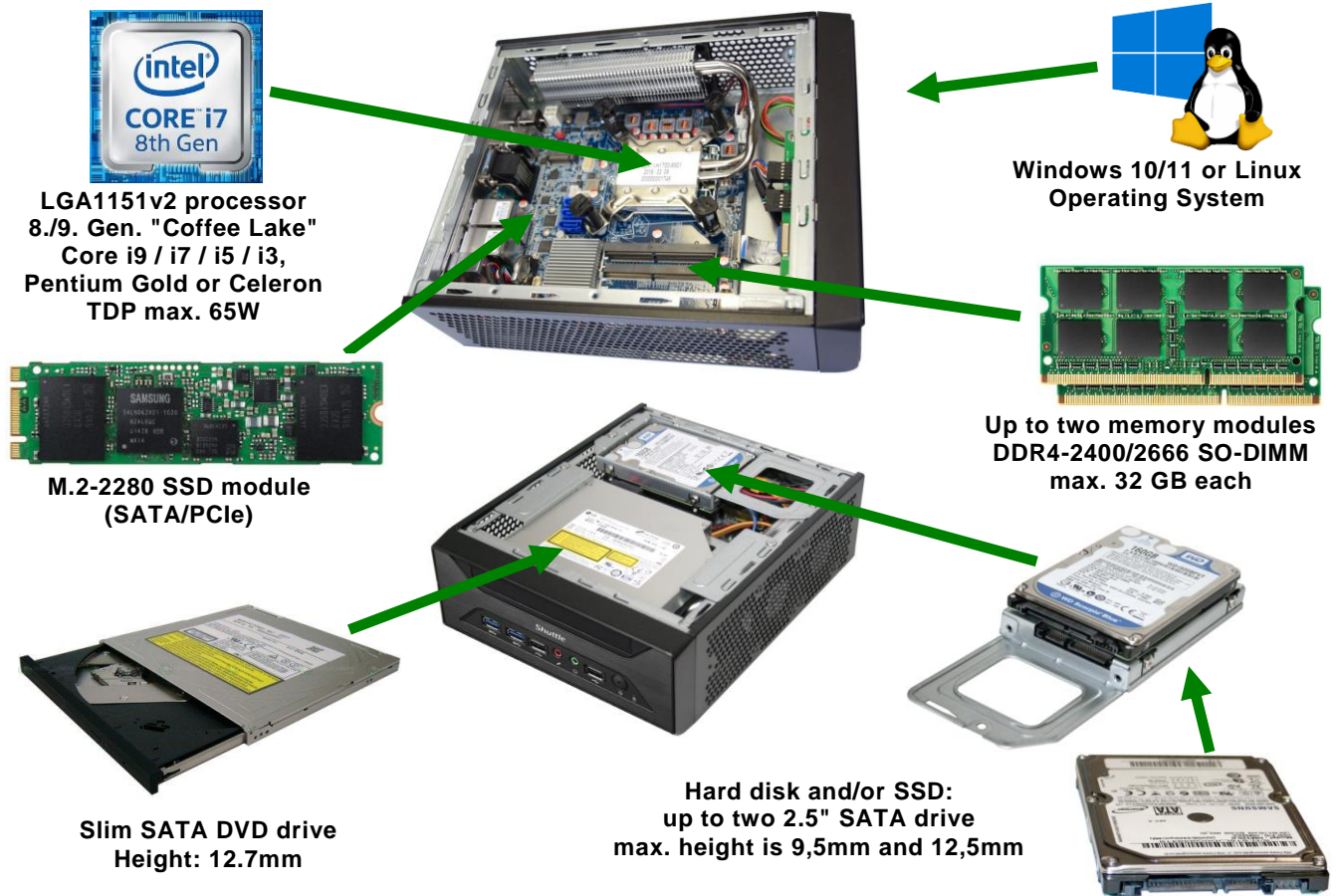
Shuttle XPC slim Barebone XH310R – Mainboard



- | | | |
|----------------------------------|--------------------------------------|-------------------------------------|
| A Back Panel Connectors | I COM Port Voltage Jumper | Q Always-Power-On Jumper |
| B Intel H310 Chipset | J 2x COM Port Header | R Embedded DisplayPort (eDP) |
| C CMOS Battery Connector | K LPC Connector | S SATA-Power 5 V |
| D Front Audio Header | L 2x COM Port Header | T SATA-Power 12 V |
| E 2x USB 2.0 Header | M Front Button/LED Connector | U LGA1151v2 CPU Socket |
| F USB 2.0 Header | N Front USB 3.0 Connector | V 2x SO-DIMM Memory Slot |
| G M.2 2230E Slot for WLAN | O M.2 2280M Slot for SSD card | W CPU FAN Connector |
| H 3x SATA 6G Connector | P ATX 12 VDC P4 connector | X System FAN Connector |

Shuttle XPC slim Barebone XH310R - Required Components

The following components need to be added to make it a fully-configured Mini PC



Note: The Shuttle XPC slim Barebone XH310R supports one optical drive and two 2.5" drives. A second 2.5" drive requires an additional SATA cable which is not included in delivery.

Note: this product do not support processors which model names end with "F" (= without integrated graphics)

Caution: For high ambient temperatures over 40 °C we strongly recommend to use SSDs instead of hard disk drives.

Optional Accessories

Vertical Stand PS01



The PC is to be used in horizontal operation by default. The optional stand allows it to be used in upright position also.

VESA Mount PV02



The optional 75/100mm VESA mount allows it to be installed on to walls or to be attached to the rear side of a monitor.

WLAN Kit WLN-M



Wireless LAN adapter (M.2-2230 card) with two external antennas supports IEEE 802.11ac and Bluetooth 4.0.

3.5" HDD Rack PHD4



PHD4 allows for installation of one 3.5" hard drive. However doing so means no other drives can be installed.

3x COM Ports PCM31



Adds three additional COM ports to the front panel. However, using PCM3 means that no optical drive can be used.

Button Cable CXP01



Adapter cable for external power button. (the button is not included).

Connectivity / Applications

The Shuttle XPC slim Barebone XH310R's wealth of ports qualifies it for a wide range of applications and external devices.



The XH310R is your powerful 3.5-litre Slim PC solution for high performance driven applications, e.g.:

- Digital Signage (supports two Ultra HD Displays)
- In-store Audio/Video entertainment
- Gambling
- Home-Media
- Office
- Call Centre
- Education
- Kiosk
- Point of Sales (POS)
- Medical
- Automation
- Small Server

Shuttle XPC slim Barebone XH310R – Product Features



The 3.5-litre chassis - a clean and modern look

Shuttle has always placed great emphasis on the interior and exterior aesthetics of their Mini-PCs with the belief that a good blend of style and form factor allow the Mini-PC to be attractive, versatile and work well in almost any environment. And the Shuttle XPC slim Barebone XH310R was designed just like that and shines in a clean and modern appearance. The optical drive and front panel connectors are elegantly concealed behind drive doors to provide maximum protection. This tiny tot barely stands 7.3 cm in height with a volume of 3.5 litres.



What does Barebone mean?

The Shuttle XPC slim Barebone XH310R consists of a stylish case with pre-installed mainboard, cooling system and external power adapter. Despite its small form factor, it offers outstanding connectivity, functionality and performance. For a complete Mini-PC system, a few components still need to be added. Once the desired operation system is installed, the XH310R is ready to use. Moreover, the system comes with pre-routed cables to reduce clutter, increase airflow and ease component installation.



Supports Intel "Coffee Lake" Processors

"Coffee Lake" is the codename for Intel's 8th and 9th Generation of Intel® Core™ Processors introduced in 2017-2019 along with the 300-Series chipsets. These CPUs are a landmark in the number of cores of their mainstream desktop processors. The 8000 series processors feature up to 6 cores and 12 threads and 12 MB of cache memory and the 9000 series up to 8 cores, 16 threads and 16 MB Cache. This XPC supports the desktop version "Coffee Lake (Refresh)" with socket LGA1151v2 and a maximum TDP of 65W, while the previous generations with LGA1151 are not compatible.



Low noise thanks to heatpipe cooling system

An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability. A heatpipe is a hollow tube containing a liquid to transfer heat. As the liquid evaporates, it carries heat to the cool end, where it condenses and then runs back to the hot end. Heatpipes thus have a much higher effective thermal conductivity than solid materials. Please keep the vent holes clear.

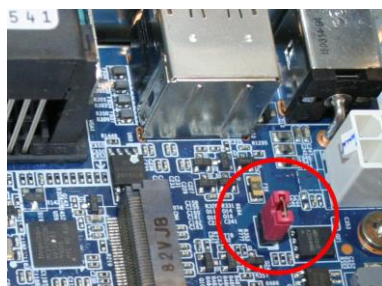


Extended temperature range and reliability

The Shuttle XPC slim Barebone XH310R is outstandingly robust thanks to its tough alu chassis, and with an operating temperature range of 0-50°C it is suitable for use in the most demanding environments. Designed entirely with all solid capacitors, XH310R is guaranteed to deliver maximum stability, reliability and longer system lifetime for long-term applications like digital signage.

Notice: for high ambient temperature over 40°C we recommend to use Solid State Disks (SSDs) instead of Hard Disk Drives (HDDs).

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Great Connectivity

On the front, elegantly hidden from view behind drive doors, the panel reveals four USB ports two of which are USB 3.0. There are also two 3.5mm jacks for headphones and microphone. In addition, the back panel offers a wide range of I/O connectivity as well.

Supports two Ultra HD Displays

The Shuttle XPC slim Barebone XH310R features two digital video outputs – one HDMI 2.0a and one DisplayPort 1.2 – both support 4K (3840 x 2160 / 2160p) resolution at 60 Hz. XH310R also features an analog D-Sub/VGA port for traditional displays. Two displays are supported simultaneously.

Up to five serial ports

Many PCs do not have these legacy ports any longer, since they have been superseded and replaced by USB for most consumer applications, but they are still commonly used for applications such as industrial automation systems, scientific analysis, POS systems and other industrial applications. The XH310R features two serial RS-232 ports in the back panel which also support both 5 or 12V auxiliary voltage. The left COM port also supports the RS422 and RS485 standard. The optional accessory PCM31 allows three additional COM ports at the front panel.

M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports M.2 SSD storage cards with SATA or with the more advanced PCIe interface. Type 2280 means, it supports the usual M.2 cards with a width of 22mm and a length of 80mm, but also 2242 and 2260 standard cards are supported.

Power on after Power fail

The BIOS setup provides a "Power-On after Power Fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure: (1) unconditional power on, (2) restore former status or (3) keep system turned off. As a matter of the nature of this function, it may fail after short power failures. This is why the Shuttle XPC slim Barebone XH310R also comes with a hardware-based solution. By removing the appropriate Jumper JP4 (see image) the system will start unconditionally once power is applied.

Input voltage: 12V or 19V

A 90 Watt power adapter with 19 Volt output voltage is included in scope of delivery. Alternatively, XH310R can also be supplied with a power source of 12 Volt ±5%. Beside the DC-input at the back panel, the mainboard also features an onboard connector for the power supply (4-pin P4 ATX 12V female).

Comparison of the 3-litre XPC slim Barebones

XH310(V) and XH310R(V) have the same technical specifications, but different chipset drivers are required.

Barebone Model	XH110(V)	XH170V	XH310(V) / XH310R(V)
Availability	March / 2016	October 2015	October 2018 / March 2019
Supported Processors	6 th /7 th Gen. Intel Core Processors, LGA1151 "Skylake" & "Kaby Lake", TDP max. 65W		8/9 th Gen. Intel Core "Coffee Lake" LGA1151v2 , TDP max. 65W [10]
Operating System	Windows 7, 8.1, 10 & Linux – 64 bit „Kaby Lake“ CPU does not support Windows 7/8.1		Windows 10/11 & Linux – 64 bit
Chipset	Intel H110	Intel H170	Intel H310
Memory (max.)	2x 16 GB DDR3L-1600 SO-DIMM (204 pins)		2x 32 GB DDR4-2400/2666 SO-DIMM (260 pins)
Multi-Monitoring	max. 2 displays	max. 3 displays	max. 2 displays
Mini-Slots	M.2-2280M (PCIe/SATA) M.2-2230E (for WLAN)	M.2-2280M (SATA) Mini-PCIe (for WLAN)	M.2-2280M (PCIe/SATA) M.2-2230E (for WLAN)
Front Panel Connectors	Power-Button, Power-LED, HDD-LED 2x USB 2.0, 2x USB 3.0, 2x Audio		Power-Button, Power- & HDD-LED 2x USB 2.0, 2x USB 3.0, 2x Audio
Back Panel Connectors	1x HDMI 1.4b 1x DisplayPort 1.2	1x HDMI 1.4b 2x DisplayPort 1.2	1x HDMI 2.0a 1x DisplayPort 1.2 1x D-Sub/VGA (1x eDP onboard)
	2x USB3.0, 2x USB2.0	2x USB3.0, 2x USB2.0	2x USB3.0, 2x USB2.0
	2x GigaBit LAN	1x GigaBit LAN	2x GigaBit LAN
	2x COM (RS232 + RS232/422/485)	1x COM (RS232/422/485)	2x COM (RS232 + RS232/422/485)
	3x Audio	3x Audio	3x Audio
	PS/2 Port (Combo)	1x eSATA	-
	Clear CMOS Button	Clear CMOS Button	4-pin connector (Power button, Clear CMOS, +5V)
Power Adapter	90W / 19V (supports 12V)	90 W / 19V	90W / 19V (supports 12V)
Optional Accessories	Vertical Stand (PS01)	Vertical Stand (PS01)	Vertical Stand (PS01)
	VESA mount (PV02)	VESA mount (PV02)	VESA mount (PV02)
	WLAN-Kit (WLN-M)	WLAN-Kit (WLN-S-P)	WLAN-Kit (WLN-M)
	3.5" HDD rack (PHD4)	3.5" HDD rack (PHD4)	3.5" HDD rack (PHD4)
	ODD bay cover (MY01) (for XH110V only)	Cover/Mylar for the slimline bay (MY01)	ODD bay cover (MY01) (for XH310RV only)
	-	-	3x COM PCM31 (for XH310/R only)
	VGA adapter (PVG01)	-	Cable for power button (CXP01)



Shuttle XPC slim Barebone XH310R - Specifications

<p><i>Chassis</i></p>	<p>Slim 3.5-litre chassis, colour: black Dimensions: 238 x 200 x 72.5 mm (LWH without rubber feet) = 3.5-litre Height including rubber feet: 73.2 mm Weight: 2.2 kg net, 3.5 kg gross Open front - without covers for optical drive and front panel connectors Hole for Kensington Lock at the back panel Operation position horizontal or even vertical with the optional stand PS01</p>
<p><i>Power Adapter</i></p>	<p>External 90 W power adapter (fanless) Input: 100~240 V AC, 50/60 Hz Output: 19 V DC, max. 4.74 A, max. 90 W output wattage AC Connector with protective-earth contacts, cable length: 1.7m DC Connector: 5.5 / 2.5mm (outer/inner diameter) Remark: the DC-input of the computer supports an external power source with either 12V±5% or 19V±5%. Beside the DC-input at the back panel, the mainboard also features an onboard connector for the power supply (4-pin P4 ATX 12V female).</p>
<p><i>Operation System</i></p>	<p>This system comes without operating system. It is compatible with Windows 10/11 and Linux (64-bit)</p>
<p><i>Processor Support</i></p>	<p>Processor Socket LGA 1151v2 Supports Intel Core i9 / i7 / i5 / i3, Pentium and Celeron processors Supports the 8th and 9th generation Intel Core processors, codename "Coffee Lake (Refresh)" in 14+ nm process technology [10] Supports processors with integrated graphics only [10] Maximum supported processor power consumption (TDP) = 65 W Up to 8 CPU cores, 16 threads and 16 MB of L3 cache Does not support the unlock-function of Intel K-Series processors. <u>Not compatible</u> with older Socket LGA 1151 processors (6th Gen. "Skylake" and 7th Gen. "Kaby Lake"). The processor integrates PCI-Express, memory controller and the graphics engine on the same die (performance features depending on processor type) Please refer to the support list for detailed processor support information at global.shuttle.com.</p>
<p><i>Heatpipe Cooling</i></p>	<p>Processor cooling with heat-pipe technology and two fans (6cm)</p>
<p><i>Mainboard Chipset BIOS</i></p>	<p>Mainboard XH310V2, Mini-ITX form factor 17 x 17 cm, 8 layer design Chipset: Intel® H310 Chipset AMI BIOS in 8 Mbit EEPROM with SPI interface All capacitors are high quality solid capacitors Supports hardware monitoring and watch dog functionality Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [1] Supports Firmware TPM v2.0 (fTPM)</p>

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<p><i>Memory Support</i></p>	<p>2x SO-DIMM slot with 260 pins Supports DDR4-2400/2666 (PC4-19200/21300) SDRAM at 1.2 V Supports Dual Channel mode Supports a maximum of 32 GB per DIMM, maximum total size: 64 GB Supports two unbuffered DIMM modules (no ECC or registered)</p>
<p><i>Integrated Graphics</i></p>	<p>The features of the integrated Intel UHD graphics function depend on the processor type used. Supports DirectX 12, OpenGL 4.5 The PC features three video outputs: - 1x HDMI v2.0a (supports 1080p/60 and 2160p/60) - 1x DisplayPort v1.2 (supports 1080p/60 and 2160p/60) - 1x Analog VGA (15-pin D-Sub) Supports two independent displays simultaneously with the integrated graphics function. Supports Blu-ray (BD) playback with HDCP content protection [3] Hardware video decoding/encoding: H.264, H. 265 (8- and 10-bit, encoding via QuickSync), VP9 (10-bit VP9 can only be decoded)</p>
<p><i>Audio</i></p>	<p>Audio Realtek® ALC 662 5.1-channel High-Definition Audio Three analog audio connectors (3.5mm) at the back panel: 1) Front line-out (head-phones) 2) Rear Surround line-out (shared with microphone input) 3) Center line-out (shared with line-in) Digital multi-channel audio output: by HDMI and DisplayPort</p>
<p><i>Dual Gigabit LAN Controller</i></p>	<p>Dual network with two RJ45 ports Used network chips: 2x Intel i211 Ethernet Controller with MAC, PHY and PCIe interface Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) Supports Teaming mode [5]</p>
<p><i>M.2-2280M Slot</i></p>	<p>The M.2 2280M slot provides the following interfaces: - PCI-Express Gen. 2.0 X4, supports NVMe - SATA v3.0 (max. 6 Gbps) It supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280). Supports M.2 SATA SSDs (with B+M key) and M.2 PCIe SSDs (with M key)</p>
<p><i>M.2-2230E Slot</i></p>	<p>Interfaces: PCI-Express Gen. 2.0 X1 und USB 2.0 Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) Supports WLAN extension cards (optional Shuttle accessory: WLN-M)</p>
<p><i>Drive Connectors</i></p>	<p>3x Serial-ATA connector, max. 6 Gbps Supports NCQ and AHCI Note: The package includes pre-installed cables (for SATA and power) and mounting screws for one 2.5" drive and one optical slimline drive.</p>

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<p><i>Storage Bays</i></p>	<p>This system features three drive bays: 1) supports one optical drive (ODD) in 5.25" slimline format with 12.7 mm height - this bay can alternatively be used for a 2.5" drive 2) upper 2.5" bay supports one 2.5" drive with max. 12.5 mm height 3) lower 2.5" bay supports one 2.5" drive with max. 9.5 mm height The system includes the following pre-installed cables: - 2x Power cable for 2.5" drives (5 Volt [6]) - 1x SATA cable for one 2.5" drive - 1x combo connector (SATA and power) for an optical slimline drive (DVD or Blu-ray) Note: This system is ready for one 2.5" drive (SSD or hard disk) and one DVD/Blu-ray drive in slimline format to be installed. For further 2.5" drives, additional SATA cables and screws are required. For a possible third 2.5" drive also a Y power cable is required. (All not included) The optional accessory PHD4 allows the installation of a 3.5" hard disk [8].</p>
<p><i>Front Panel Connectors</i></p>	<p>Front Panel connectors Microphone input Audio Line-out (headphones) 2x USB 3.0 (= USB 3.1 Gen 1) 2x USB 2.0 Power button Power LED (blue) HDD LED (yellow)</p>
<p><i>Back Panel Connectors</i></p>	<p>1x DisplayPort 1.2 audio/video output [2] 1x HDMI 2.0a audio/video output 1x Analog VGA video output (15-pin D-Sub) Note: a maximum of two displays can be operated at the same time. 2x USB 3.0 (= USB 3.1 Gen 1) 2x USB 2.0 2x GigaBit LAN (RJ45) 1x COM (RS232) - on the right side 1x COM (RS232/422/485) - middle/down 3x Audio 3.5mm (Line-in, Line-out, Mic-in) 1x DC-input connector for external power adapter (supports 12V±5% or 19V±5%) 1x 4-pin connector (2.54 mm pitch) supports: - external power on button (see optional accessory CXP01) - Clear CMOS function - +5V DC voltage for external components 2x Perforation for Wireless LAN antennas 1x Hole for Kensington Lock</p>
<p><i>Other Onboard Connectors</i></p>	<p>Jumper for power-on-after-power-fail (hardware solution) [1] Front connectors for power button, LEDs, USBs, audio ports USB 2.0 headers (4-pin) 4x RS232 COM port (2x5-pin header, 2 mm pitch) - 1x occupied Two 4-pin fan connectors (one occupied by the CPU cooling system) LPC interface (2x5-pin header, 2 mm pitch) Embedded DisplayPort (eDP, 2x 15-pin) Power input connector (4-pin P4 ATX 12V female)</p>

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<p><i>Supplied Accessories</i></p>	<p>Multi-language installation guide (EN, DE, FR, ES, JP, KR, SC, TC) DVD with Windows driver software and manuals in PDF format Pre-installed SATA and power cables for one 2.5" drive and one slimline drive External power adapter with 1.7m AC power cord (with protective-earth contacts) Protector cap for the CPU socket (do not use if heat-pipe or fan is mounted) CPU heatpipe cooling system with heatsink compound 2 screws for installation of two M.2 cards 8 screws for installation of two 2.5" drives 2 screws for installation of an optional slimline drive</p>
<p><i>Optional Accessories</i></p>	<p>PS01: Vertical stand PV02: VESA mount WLN-M: WLAN module [4] PHD4: 3.5" Hard Disk Rack [8] CXP01: adapter cable for external power button PCM31: Adapter for three additional RS232 COM ports [9]</p>
<p><i>Environmental Specifications</i></p>	<p>Operating temperature range: 0~50°C [7] Relative humidity range: 10~90% (non-condensing)</p>
<p><i>Conformity and Certifications</i></p>	<p>EMI: FCC, CE, BSMI, C-Tick Safety: ETL, CB, BSMI Other: RoHS, Energy Star 5.0, ErP This device is classed as a technical information equipment (ITE) in class B and is intended for use in living room and office. The CE-mark approves the conformity by the EU directives: (1) 2004/108/EC relating to electromagnetic compatibility (EMC), (2) 2006/95/EC relating to Electrical Equipment designed for use within certain voltage limits (LVD), (3) 2009/125/EC relating to ecodesign requirements for energy-related products (ErP)</p>

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Notes:**[1] Power-on-after-power-fail:**

The BIOS setup provides a "Power-on-after-power-fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure: (1) unconditional power on, (2) restore former status or (3) keep system turned off. As a matter of the nature of this function, it may fail after short power failures. This is why this PC also comes with a hardware-based solution. By removing the appropriate jumper JP4, the system will start unconditionally once power is supplied.

[2] How to convert DisplayPort into HDMI/DVI

The DisplayPort output can be converted to HDMI or DVI by an additional, passive adapter cable. For example:
DELOCK 82590: 1m, DisplayPort (male, 20p) to HDMI-A (male, 19p)
DELOCK 82435: 5m, DisplayPort (male, 20p) to DVI-D (male, 24p)

The integrated graphics automatically detects the connected display and puts out the appropriate electric signal - either DisplayPort (without an adapter) or HDMI/DVI (with an adapter).

However, a monitor with a DisplayPort connector cannot be connected to the HDMI port with a simple, passive adapter.

[3] For Blu-ray playback appropriate software and a Blu-ray drive is required (not included).

[4] Optional Wireless LAN module:

This Slim PC supports an optional WLAN module which consists of an M.2 expansion card with IEEE 802.11ac, Bluetooth 4.0 functionality and two external antennas with appropriate cables. Shuttle offers its suitable accessory kit "WLN-M".

[5] Teaming Mode

The teaming function allows for grouping both available network adapters to work as one single adapter. The benefit of this approach is that it enables load balancing and failover.

Driver download: <https://downloadcenter.intel.com/download/21642>

[6] Power connector for SATA drives

The supplied power cables for SATA drives provide a voltage of 5V. Only in very exceptional cases a 2.5" hard disk also requires a 12V line, which is not supported out-of-the-box (only via an optional adapter, included by PHD4).

[7] High ambient temperature

For high ambient temperature over 40°C we strongly recommend to use SSDs instead of hard disk drives.

[8] The optional accessory PHD4 allows for installation of one 3.5" hard drive. However doing so means no other drives such as a slimline DVD drive or a 2.5" HDD/SSD can be used.

[9] Optional COM port accessory PCM31

This accessory provides three additional COM ports to the front panel which means the upper bay can no longer be used for an optical drive.

[10] Important notes regarding 9th generation processors

The 9th generation of Intel Core desktop processors (9000 series with code name "Coffee Lake Refresh") are supported since BIOS version XH310200.105 (date 2019-04-22). Download area: global.shuttle.com

Please don't use processors with model numbers ending with "F" (e.g. Intel Core i5-9400F) which do not support integrated graphics.

8th Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14 nm++ "Coffee Lake S" processor overview (Date: May 2018)

Processors with a TDP>65W are **not** supported (marked in red)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Smart Cache	TDP	Memory Support	Graphics Engine (clock in MHz)
Core i7	8700K	6 / 12	3.7 GHz	4.7 GHz	12 MB	95 W	DDR4-2666	UHD 630, 350-1200 MHz
	8700	6 / 12	3.2 GHz	4.6 GHz	12 MB	65 W	DDR4-2666	UHD 630, 350-1200 MHz
	8700T	6 / 12	2.4 GHz	4.0 GHz	12 MB	35 W	DDR4-2666	UHD 630, 350-1200 MHz
Core i5	8600K	6 / 6	3.6 GHz	4.3 GHz	9 MB	95 W	DDR4-2666	UHD 630, 350-1150 MHz
	8600	6 / 6	3.1 GHz	4.3 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1150 MHz
	8600T	6 / 6	2.3 GHz	3.7 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350-1150 MHz
	8500	6 / 6	3.0 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1100 MHz
	8500T	6 / 6	2.1 GHz	3.5 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350-1100 MHz
	8400	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1050 MHz
	8400B	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1050 MHz
	8400T	6 / 6	1.7 GHz	3.3 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350-1050 MHz
Core i3	8350K	4 / 4	4.0 GHz	-	8 MB	91 W	DDR4-2400	UHD 630, 350-1150 MHz
	8300	4 / 4	3.7 GHz	-	8 MB	62 W	DDR4-2400	UHD 630, 350-1150 MHz
	8300T	4 / 4	3.2 GHz	-	8 MB	35 W	DDR4-2400	UHD 630, 350-1150 MHz
	8100	4 / 4	3.6 GHz	-	6 MB	65 W	DDR4-2400	UHD 630, 350-1100 MHz
	8100T	4 / 4	3.1 GHz	-	6 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
Pentium Gold	G5600	2 / 4	3.9 GHz	-	4 MB	51 W	DDR4-2400	UHD 630, 350-1100 MHz
	G5500	2 / 4	3.8 GHz	-	4 MB	51 W	DDR4-2400	UHD 630, 350-1100 MHz
	G5500T	2 / 4	3.2 GHz	-	4 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
	G5400	2 / 4	3.7 GHz	-	4 MB	51 W	DDR4-2400	UHD 610, 350-1050 MHz
	G5400T	2 / 4	3.1 GHz	-	4 MB	35 W	DDR4-2400	UHD 610, 350-1050 MHz
Celeron	G4950	2 / 2	3.3 GHz	-	2 MB	54 W	DDR4-2400	UHD 610, 350-1050 MHz
	G4920	2 / 2	3.2 GHz	-	2 MB	54 W	DDR4-2400	UHD 610, 350-1050 MHz
	G4900	2 / 2	3.1 GHz	-	2 MB	54 W	DDR4-2400	UHD 610, 350-1050 MHz
	G4900T	2 / 2	2.9 GHz	-	2 MB	35 W	DDR4-2400	UHD 610, 350-1050 MHz

K = unlocked: einstellbarer Takt-Multiplikator, T = stromsparend, TDP = Thermal Design Power (max. Verlustleistung)
Hinweis: Das Shuttle XPC slim Barebone XH310R unterstützt nicht die Unlock-Funktion von Intel Prozessoren der K-Serie
Detaillierte Informationen über kompatible Prozessoren finden Sie in der Support-Liste unter global.shuttle.com.

9th Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14 nm++ "Coffee Lake S" processor overview (Date: May 2018)
Processors with a TDP>65W and processors without graphics function (ID ends with "F")
are **not** supported (marked in red)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Smart Cache	TDP	Memory Support	Graphics Engine (clock in MHz)
Core i9	9900K	8 / 16	3.6 GHz	5.0 GHz	16 MB	95 W	DDR4-2666	UHD 630, 350-1200 MHz
	9900KF	8 / 16	3.6 GHz	5.0 GHz	16 MB	95 W	DDR4-2666	None
	9900	8 / 16	3.1 GHz	5.0 GHz	16 MB	65 W	DDR4-2666	UHD 630, 350-1200 MHz
	9900T	8 / 16	2.1 GHz	4.4 GHz	16 MB	35 W	DDR4-2666	UHD 630, 350-1200 MHz
Core i7	9700K	8 / 8	3.6 GHz	4.9 GHz	12 MB	95 W	DDR4-2666	UHD 630, 350-1200 MHz
	9700KF	8 / 8	3.6 GHz	4.9 GHz	12 MB	95 W	DDR4-2666	None
	9700	8 / 8	3.0 GHz	4.7 GHz	12 MB	65 W	DDR4-2666	UHD 630, 350-1200 MHz
	9700T	8 / 8	2.0 GHz	4.3 GHz	12 MB	35 W	DDR4-2666	UHD 630, 350-1200 MHz
Core i5	9600K	6 / 6	3.7 GHz	4.6 GHz	9 MB	95 W	DDR4-2666	UHD 630, 350-1150 MHz
	9600KF	6 / 6	3.7 GHz	4.6 GHz	9 MB	95 W	DDR4-2666	None
	9400	6 / 6	2.9 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1050 MHz
	9400F	6 / 6	2.9 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	None
	9400T	6 / 6	1.8 GHz	3.4 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350-1050 MHz
Core i3	9350K	4 / 4	4.0 GHz	4.6 GHz	8 MB	91 W	DDR4-2400	UHD 630, 350-1150 MHz
	9350KF	4 / 4	4.0 GHz	4.6 GHz	8 MB	91 W	DDR4-2400	None
	9320	4 / 4	3.7 GHz	4.4 GHz	8 MB	62 W	DDR4-2400	UHD 630, 350-1150 MHz
	9300	4 / 4	3.7 GHz	4.3 GHz	8 MB	62 W	DDR4-2400	UHD 630, 350-1150 MHz
	9300T	4 / 4	3.1 GHz	3.7 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
	9300TE	4 / 4	2.2 GHz	3.2 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1050 MHz
	9100	4 / 4	3.6 GHz	4.2 GHz	6 MB	65 W	DDR4-2400	UHD 630, 350-1100 MHz
	9100F	4 / 4	3.6 GHz	4.2 GHz	6 MB	65 W	DDR4-2400	None
	9100T	4 / 4	3.1 GHz	3.7 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
	9100TE	4 / 4	2.2 GHz	3.2 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1050 MHz
	9100E	4 / 4	3.1 GHz	3.7 GHz	6 MB	65 W	DDR4-2400	UHD 630, 350-1050 MHz

K = unlocked, T = Power optimized lifestyle, F = without integrated graphics

TDP = Thermal Design Power (max. Power Consumption).

Note: The Shuttle XPC slim Barebone XH310R does not support the Unlock-function of Intel K-Series processors.
Please refer to the support list for detailed processor support information at global.shuttle.com.

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