Shuttle®

BAREBONE
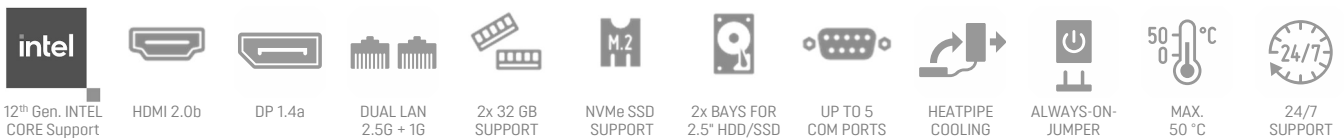## XPC slim
XH610

AFFORDABLE 3.5-LITRE PC FOR DEMANDING TASKS
The Shuttle XPC slim Barebone XH610 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. In addition, it supports the powerful Gen. 12 Intel Core desktop processors with socket LGA1700. The built-in heatpipe cooling ensures the system runs quietly at maximum stability. 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 digital displays with Ultra HD resolution, one VGA display, dual LAN (2.5G + 1G), four USB 3.2 Gen 1 and four USB 2.0 ports and up to five serial ports. With this high level of efficiency and flexibility - who needs a bulky tower PC anyway?

Note: the optical drive is not included.

12th Gen. INTEL CORE Support	HDMI 2.0b	DP 1.4a	DUAL LAN 2.5G + 1G	2x 32 GB SUPPORT	NVMe SSD SUPPORT	2x BAYS FOR 2.5" HDD/SSD	UP TO 5 COM PORTS	HEATPIPE COOLING	ALWAYS-ON-JUMPER	MAX. 50 °C	24/7 SUPPORT

SLIM DESIGN
- Robust black steel chassis with open front (without I/O covers)
- Dimensions: 23.8 x 20 x 7.25 cm (LWH), ca. 3.5-litre ■ Supports 24/7 Nonstop Operation ■ Operating temperature: 0~50 °C (non-condensing)
- Mini-ITX Mainboard (17 x 17 cm) ■ Hole for Kensington Lock

OPERATING SYSTEM
- An operating system is not included
- Supports Windows 10/11 and Linux (64-bit)

PROCESSOR SUPPORT
- Socket LGA1700 supports 12th-gen Intel Core i9/i7/i5/i3, Pentium Gold und Celeron processors, codenamed "Alder Lake-S", 10 nm, max. 65W TDP
- Includes heatpipe cooling system with two fans

CHIPSET
- Intel H610 Chipset

MEMORY SUPPORT
- 2x 260-pin SO-DIMM slot ■ Supports DDR4-3200/2666/2400
- max. 2x 32 GB

STORAGE BAYS AND M.2 SLOTS
- 1x 5.25" bay for optical slimline drive (SATA, 12.7 mm height)
- 2x 2.5" bay for SATA hard disk or SSD, max. 9.5 and 12.5 mm
- 1x M.2-2280M slot for M.2 SSDs with PCIe x4 NVMe or SATA
- 1x M.2-2230E slot supports an optional M.2 WLAN card

CONNECTORS
- HDMI 2.0b ■ DisplayPort 1.4a ■ D-Sub VGA ■ 4x USB 3.2 Gen1 (1x Type-C) ■ 4x USB 2.0 ■ 2x COM (1x RS232 and 1x RS232/422/485)
- 5x audio ports (3.5 mm) ■ Dual Gigabit LAN (2.5G and 1G)
- Connector for external power button ■ "Always-On" jumper ■ DC input

POWER SUPPLY
- External 120 W / 19 V power adapter (DC input supports 12V and 19V)

OPTIONAL ACCESSORIES
- WLAN Modul (WLN-M (ac)/WLN-M1 (ax)) ■ LTE accessory (WWN03)
- Vertical Stand (PS01) ■ VESA mount (PV02) ■ 3.5" HDD Rack ■ Cable for external power button (CXP01) ■ Triple RS232 COM port (PCM31)

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Comparison of product versions:

XH610 with open front

XH610V with front doors

PRODUCT FEATURES

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 XH610 was designed just like that and shines in a clean and modern appearance. This tiny tot barely stands 7.3 cm in height with a volume of 3.5 litres.

Low noise thanks to heatpipe cooling system
An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability.

Supports extended temperature range and 24/7 operation
The Shuttle XPC slim Barebone XH610 is officially approved for 24/7 permanent operation. Thanks to its efficient cooling, this PC runs highly reliably making it perfectly suitable for digital signage and POI/POS applications - even at ambient temperatures of up to 50 °C (non-condensing).
Caution: For high ambient temperatures over 40 °C we strongly recommend to use SSDs.

Supports 12th Generation Intel® Core™ processors
"Alder Lake-S" is the codename for Intel's 12th Generation of Intel® Core™ Desktop Processors for socket LGA1700 introduced in 2021/2022 along with the 600-Series chipsets. The 12000 series processors feature a new hybrid design combining a number of performance cores (P-cores) and efficiency cores (E-cores). Get the performance you need, where you need it – whether you're a gamer, creator, streamer, or everyday user.

Dual 4K Display support + VGA
The XH610 features two digital video outputs: HDMI 2.0b and DisplayPorts (DP 1.4) which both can run at 4K (3840 x 2160 / 2160p) high resolution at 60 Hz frames per second. Furthermore, the XH610 has an D-Sub/VGA port. The PC supports a maximum of three displays.

One M.2-Slot for SSD cards
The M.2-2280 slot supports one M.2 SSD storage card with NVMe/PCIe or SATA interface. Type 2280 means, it supports the usual M.2 cards with a width of 22 mm and a length of 80 mm, but also 2242 and 2260 standard cards are supported.

Flexible options for drives
XH610 offers the following options for the installation of SATA drives:
(1) one optical slimline drive and up to two 2.5" drives
(2) up to three 2.5" drives
(3) one large 3.5" hard drive
Note: some configurations require additional accessories that are not supplied.

Dual Network (Intel 1G + 2.5G)
The Shuttle XPC slim Barebone XH610 supports Dual LAN with Intel network adapters, which are popular for their excellent performance and driver compatibility and are the preferred choice for professional environments. One LAN port even supports up to 2.5Gbps over your existing Cat5e or better cabling. With XH610 you can expand your network's bandwidth and reduce digital bottlenecks.

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 (3) keep system turned off (4) Power-On by LAN or (5) Power-On by Real-Time-Clock. As a matter of the nature of this function, it may fail after short power failures. This is why the XH610 also comes with a hardware-based solution. By removing Jumper JP4 the system will start unconditionally once power is applied.

External power button by separate remote line
If, because of space constraints (e.g. in case of fixed installation), the machine cannot be switched on by pressing the front power button, it can be powered on by a separate remote line. You will find an appropriate four-pin connector at the back panel of the XH610 (pitch 2.54 mm). Furthermore, this connector provides a Clear CMOS function and +5V DC voltage supply for external devices.

+5V voltage (2)   (4) Power Button
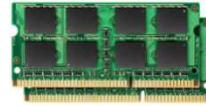Clear CMOS (1)   (3) Ground

REQUIRED COMPONENTS

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

Shuttle XPC slim Barebone XH610

Optical Drive

Two bays for 2.5" HDD/SSD

LGA1700 Processor
Intel Core Gen 12 "Alder Lake-S"
Core i9 / i7 / i5 / i3, Pentium Gold or Celeron
TDP max. 65 W

Memory Modules
Up to two DDR4-3200/2666/2400
SO-DIMM memory modules
max. 32 GB each

M.2 SSD
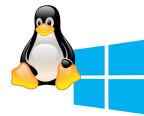M.2-2280/2260/2242
SSD storage (SATA or PCIe/NVMe)

Optical Drive
5.25" Slimline form factor, height: 12.7 mm
with SATA connector

One or two 2.5" Storage Drives
SATA hard disk and/or Solid State Disk (SSD)
Max. height: 12.5 mm and 9.5 mm
Note: instead of the optical drive, a third 2.5"
drive can also be installed. A SATA cable for
the second/third device is not included.

Operating System
Windows 10/11 or Linux (64-bit only)

OPTIONAL ACCESSORIES FROM SHUTTLE

WLAN-Accessory
WLN-M (802.11ac / Wifi 5)
WLN-M1 (802.11ax / Wifi 6)
M.2-2230 card supports WLAN
and BT - including 2 antennas

LTE Adapter Kit WWN03
allows the installation of an
M.2 LTE card and nano SIM
card (occupies the 2.5" bay)

Triple COM-Port PCM31
Adds three additional RS232
COM ports to the front (occu-
pies the ODD bay)

Cable CXP01
Cable for external push button
switch (without button)

3.5" HDD Rack PHD4
Allows for installation of one
3.5" hard drive. However doing
so means no other drives can
be installed, except M.2 SSD.

Vertical Stand PS01
for the vertical operation

Vesa Mount PV02
75x75 / 100x100 mm VESA
mount

Front and Back Panel and Mainboard

Front panel


Back panel

Mainboard

1. 5.25" bay for optical slimline drive
2. 2x USB 2.0
3. USB 3.2 Gen 1 Type-A
4. Microphone input
5. Headphones output
6. USB 3.2 Gen 1 Type-C
7. Power button with Power LED indicator
8. LED indicator for storage activity

9. 2x Thumbscrew
10. 2x Perforation for optional WLAN antenna
11. Hole for Kensington Lock
12. DC-in connector for power adapter
13. DisplayPort 1.4a
14. HDMI 2.0b port
15. D-Sub VGA port
16. RS232/422/485 COM port
17. 4-pin connector (2.54 mm pitch) for external power button, Clear CMOS button and 5V DC voltage
18. Gigabit LAN port (RJ45)
19. 2.5G LAN port (RJ45)
20. 2x USB 3.2 Gen 1 port
21. 2x USB 2.0 port
22. Audio Line-in port
23. Audio Line-out port
24. Audio Microphone input
25. RS232 COM port
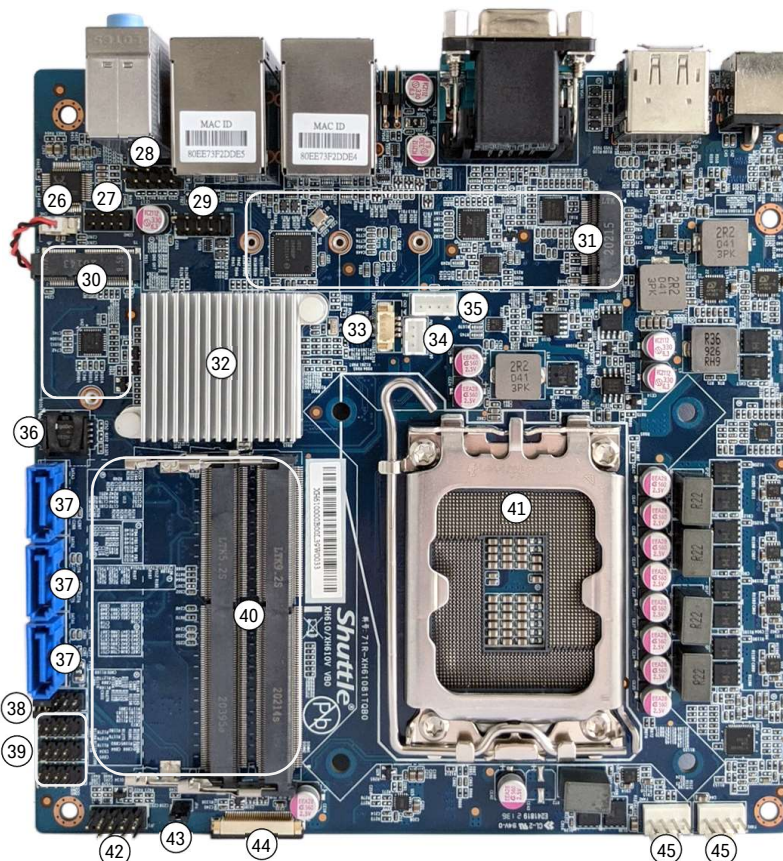
26. Connector for CMOS battery
27. Onboard RS232 COM port
28. Audio connectors for front panel
29. 2x5-pin onboard connector for 2x USB 2.0
30. M.2-2230E slot for optional WLAN module
31. M.2-2280M slot for SSD module
32. Intel H610 chipset
33. 4-pin onboard connector for USB 2.0
34. 12V power connector for SATA drive
35. 5V power connector for SATA drive
36. Flash memory for BIOS/Firmware
37. 3x SATA connectors
38. Jumper for COM port voltage setting
39. 3x RS232 header for COM ports on the front panel (optional accessory Shuttle PCM31)
40. 2x SO-DIMM sockets for DDR4 memory
41. CPU socket for LGA1700 processors
42. Connector for front panel buttons and LEDs
43. Jumper JP4 for "Always on" function
44. USB 3.0 header for front panel ports
45. 2x fan connectors (4-pin)

Shuttle Product Comparison: XH310R(V) versus XH610(V)

MODEL	XH310R / XH310RV	XH610 / XH610V
Processor Support	8th / 9th Gen. Intel Core Processors "Coffee Lake-S" Socket LGA1151v2, TDP max. 65W	12th Gen. Intel Core Processors "Alder Lake-S" Socket LGA1700, TDP max. 65W
OS Support	Windows 10 & Linux – 64-bit	Windows 10 & Linux – 64-bit
Chipset	Intel H310 Supports Dual Display	Intel H610 Supports Triple Display
Memory (max.)	2x 32 GB DDR4-2666/2400 SO-DIMM (260 pins)	2x 32 GB DDR4-3200/2666/2400 SO-DIMM (260 pins)
Drive Bays	1x 5.25" Slimline ODD bay (12.7 mm) 2x 2.5" bay (12.5 & 9.5 mm) 1x M.2-2280 SSD slot (PCIe X4, SATA)	1x 5.25" Slimline ODD bay (12.7 mm) 2x 2.5" bay (12.5 & 9.5 mm) 1x M.2-2280 SSD slot (PCIe X4, SATA)
Front Panel Ports	2x USB 3.2 Gen 1 2x USB 2.0 2x Audio Power-Button Power-LED, HDD-LED	2x USB 3.2 Gen 1 (1x Type-C) 2x USB 2.0 2x Audio Power-Button Power-LED, HDD-LED
Back Panel Ports	HDMI 2.0a DisplayPort 1.2 D-Sub/VGA 2x USB 3.2 Gen 1 2x USB 2.0 2x Gigabit LAN (Intel 211) 2x COM RS232 (1x RS422/485) DC input (supports 12V and 19V) 4-pin header for ext. power button	HDMI 2.0b DisplayPort 1.4 D-Sub/VGA 2x USB 3.2 Gen 1 2x USB 2.0 Gigabit LAN (Intel 219) 2.5G LAN (Intel 225) 2x COM RS232 (1x RS422/485) DC input (supports 12V and 19V) 4-pin header for ext. power button
Power Adapter	90 W / 19 V	120 W / 19 V
Optional Accessories	Vertical stand (PS01) VESA mount (PV02) Power Button cable (CXP01) Triple COM (PCM31) for XH610 Slimline bay cover (MY01) for XH610V 3.5" HDD rack (PHD4) WLAN kit (WLN-M / WLN-M1)	Vertical stand (PS01) VESA mount (PV02) Power Button cable (CXP01) Triple COM (PCM31) for XH610 Slimline bay cover (MY01) for XH610V 3.5" HDD rack (PHD4) WLAN kit (WLN-M / WLN-M1) LTE kit (WWN03)
Chassis Dimensions	24 x 20 x 7.25 cm (ca. 3.5 L)	24 x 20 x 7.25 cm (ca. 3.5 L)
Front View (open front)	XH310R – open front	XH610 – open front
Front View (with front doors)	XH310RV – with front doors	XH610V – with front doors
Back View		

SHUTTLE XPC SLIM BAREBONE XH610 — SPECIFICATIONS

CHASSIS	Slim 3.5-litre chassis, colour: black Dimensions: 238 x 200 x 72.5 mm (LWH without rubber feet) = ca. 3.5-litre Height including rubber feet: 73.3 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 backpanel Operation position horizontal or even vertical with the optional stand PS01
POWER ADAPTER	External 120 W power adapter (fanless) Input: 100~240 V AC, 50/60 Hz Output: 19 V DC, max. 6.32 A, max. 120 W output wattage DC Connector: 5.5 / 2.5mm (outer/inner diameter) AC mains cable: 3 pins, ca. 1.8 m length, with C5/C6 coupler (called "Mickey Mouse" or "Clover-leaf") for the power adapter and CEE-7/7 plug with earth-contact (type E+F) for the power outlet Remark: the DC-input of the computer supports an external power source with either 12V±5% or 19V±5%.
OPERATING SYSTEM	This system comes without operating system. It is compatible with Windows 10/11 and Linux (64-bit)
PROCESSOR SUPPORT	Processor Socket LGA1700 Supports Intel Core i9 / i7 / i5 / i3, Pentium Gold and Celeron processors Supports 12th generation Intel Core processors, codename "Alder Lake-S" in 14 nm process technology Supports processors with integrated graphics only [5] Maximum supported processor power consumption (TDP) = 65 W Does not support the unlock-function of Intel K-Series processors. The processor integrates PCI-Express, memory controller and the graphics engine on the same die. (Performance features depend on processor type) Please refer to the support list for detailed processor support information at global.shuttle.com.
PROCESSOR COOLING	Processor cooling with heat-pipe technology and two fans (6cm)
MAINBOARD, CHIPSET, BIOS	Mainboard in Mini-ITX form factor 17 x 17 cm Chipset: Intel® H610 AMI BIOS in 32 MB EEPROM All capacitors are high quality solid capacitors Supports hardware monitoring and Watchdog functionality Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [1] Supports Firmware TPM v2.0 (fTPM)
MEMORY SUPPORT	2x SO-DIMM slot with 260 pins Supports DDR4-3200/2933/2666/2400/2133 (PC4-25600/23466/21300/19200/17000) 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)
INTEGRATED GRAPHICS	The features of the integrated Intel UHD graphics function depend on the processor type used [5]. The PC features three video outputs: - 1x HDMI v2.0b (supports 1080p/60 and 2160p/60) - 1x DisplayPort v1.4a (supports 1080p/60 and 2160p/60) - 1x Analog VGA (15-pin D-Sub, supports 1080p/60) Supports three independent displays simultaneously with the integrated graphics function. Hardware video decoding/encoding: H.264, H. 265 (8- and 10-bit, encoding via QuickSync), VP9 (10-bit VP9 can only be decoded)
AUDIO	Audio Realtek® ALC 897/662/888 High-Definition Audio Three analog audio connectors (3.5mm) at the backpanel: 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

DUAL LAN	Dual network with two RJ45 ports with two status LEDs each - yellow LED: lights up when data transfer is active - greed LED for speed mode: off at 10 Mbps, lights up when 10 Mbit or higher Used network chips: 1) Intel 225 supports 100 / 1.000 / 2.500 Mbps data transfer rate 2) Intel 219LM supports 10 / 100 / 1.000 Mbps data transfer rate PCIe interface Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
M.2-2280M SSD SLOT	The M.2 2280M slot provides the following interfaces: - PCI-Express Gen. 3.0 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 SSDs with SATA or PCI-Express interface
M.2-2230E SLOT FOR WLAN CARDS	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 expansion cards Optional Shuttle accessory: WLN-M / WLN-M1 [4]
SATA CONNECTORS	3x Serial-ATA connector, max. 6 Gbps Supports NCQ and AHCI
STORAGE BAYS	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 optical drive in slimline format to be installed. For further 2.5" drives, additional SATA cables are required. For a possible third 2.5" drive also four screws M3x4 are required. The optional accessory PHD4 allows the installation of a 3.5" hard disk [8].
FRONT PANEL CONNECTORS	Microphone input Audio Line-out (headphones) 1x USB 3.2 Gen 1 Type A (max. 5 Gbps, blue) 1x USB 3.2 Gen 1 Type C (max. 5 Gbps) 2x USB 2.0 (black) Power button Power LED (blue) HDD LED (yellow)
BACK PANEL CONNECTORS	1x DisplayPort 1.4a audio/video output [2] 1x HDMI 2.0b audio/video output 1x Analog VGA video output (15-pin D-Sub) 2x USB 3.2 Gen 1 Type A (max. 5 Gbps, blue) 2x USB 2.0 (black) 2x RJ45 LAN (1 Gbps and 2.5 Gbps) 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

OTHER ONBOARD CONNECTORS	Jumper J4 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) SATA power connectors: 5V (4-pin, occupied) and 12V (3-pin)
SUPPLIED ACCESSORIES	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 ca. 1.8m 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 pre-installed with heatsink compound 2 screws (M3x5, silver) for installation of two M.2 cards 8 screws (M3x4, black) for installation of two 2.5" drives 4 screws (M2x2.5, silver) for installation of an optional slimline drive
OPTIONAL ACCESSORIES	**PS01:** Vertical stand **PV02:** VESA mount **WLN-M** (802.11ac, Wifi 5) or **WLN-M1** (802.11ax, Wifi 6): 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 **[3]**
ENVIRONMENTAL SPECIFICATIONS	Operating temperature range: 0~50°C **[7]** Relative humidity range: 10~90% (non-condensing)
CERTIFICATIONS / COMPLIANCE	EMI: CE, UKCA, FCC, BSMI, RCM, VCCI Safety: CB 60950/62368, cTUVus, BSMI Other: RoHS, Energy Star, 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)

[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 supports Dual-mode (DP++) and 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). Please note that DVI/HDMI monitors are only operated in single-link mode, i.e. max. 1920x1200 with 60 Hz. However, a monitor with a DisplayPort connector cannot be connected to the HDMI port with a simple, passive adapter.

[3] 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.

[4] Optional Wireless LAN module:
This slim PC can optionally be upgraded with WLAN/Bluetooth functionality. Shuttle offers the suitable accessory kits "WLN-M" and "WLN-M1", consisting of a WLAN card in M.2-2230 format and two external antennas with appropriate antenna cables.

[5] Intel processors without integrated graphics (ID ends with "F", e.g. Core i7-12700F) are not compatible.

[6] 12V 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.

12TH GENERATION INTEL CORE DESKTOP PROCESSOR FAMILY

Socket LGA1700 10 nm "Alder Lake S" processor overview (Date: January 2022)
Processors with a TDP of more than 65W and processors without graphics function (ID ends with "F") are not supported (marked in red).

PROCESSOR	MODEL	P-CORES/ THREADS	P-CORES CLOCK/Turbo	E-CORES	E-CORES CLOCK/Turbo	SMART CACHE	BASE TDP	MEMORY SUPPORT	GRAPHICS ENGINE (MAX. CLOCK)
Core™ i9	12900K	8 / 16	3.2 – 5.1 GHz	8	2.4 – 3.9 GHz	30 MB	125 W	DDR4-3200	UHD 770 (1.55 GHz)
	12900KF	8 / 16	3.2 – 5.1 GHz	8	2.4 – 3.9 GHz	30 MB	125 W	DDR4-3200	None
	12900	8 / 16	2.4 – 5.0 GHz	8	1.8 – 3.8 GHz	30 MB	65 W	DDR4-3200	UHD 770 (1.55 GHz)
	12900F	8 / 16	2.4 – 5.0 GHz	8	1.8 – 3.8 GHz	30 MB	65 W	DDR4-3200	None
	12900T	8 / 16	1.4 – 4.8 GHz	8	1.0 – 3.6 GHz	30 MB	35 W	DDR4-3200	UHD 770 (1.55 GHz)
Core™ i7	12700K	8 / 16	3.6 – 4.9 GHz	4	2.7 – 3.8 GHz	25 MB	125 W	DDR4-3200	UHD 770 (1.50 GHz)
	12700KF	8 / 16	3.6 – 4.9 GHz	4	2.7 – 3.8 GHz	25 MB	125 W	DDR4-3200	None
	12700	8 / 16	2.1 – 4.9 GHz	4	1.6 – 3.6 GHz	25 MB	65 W	DDR4-3200	UHD 770 (1.50 GHz)
	12700F	8 / 16	2.1 – 4.9 GHz	4	1.6 – 3.6 GHz	25 MB	65 W	DDR4-3200	None
	12700T	8 / 16	1.4 – 4.6 GHz	4	1.0 – 3.4 GHz	25 MB	35 W	DDR4-3200	UHD 770 (1.50 GHz)
Core™ i5	12600K	6 / 12	3.7 – 4.9 GHz	4	2.8 – 3.6 GHz	20 MB	125 W	DDR4-3200	UHD 770 (1.45 GHz)
	12600KF	6 / 12	3.7 – 4.9 GHz	4	2.8 – 3.6 GHz	20 MB	125 W	DDR4-3200	None
	12600	6 / 12	3.3 – 4.8 GHz	–	–	18 MB	65 W	DDR4-3200	UHD 770 (1.45 GHz)
	12600T	6 / 12	2.1 – 4.6 GHz	–	–	18 MB	35 W	DDR4-3200	UHD 770 (1.45 GHz)
	12500	6 / 12	3.0 – 4.6 GHz	–	–	18 MB	65 W	DDR4-3200	UHD 770 (1.45 GHz)
	12500T	6 / 12	2.0 – 4.4 GHz	–	–	18 MB	35 W	DDR4-3200	UHD 770 (1.45 GHz)
	12400	6 / 12	2.5 – 4.4 GHz	–	–	18 MB	65 W	DDR4-3200	UHD 730 (1.45 GHz)
	12400F	6 / 12	2.5 – 4.4 GHz	–	–	18 MB	65 W	DDR4-3200	None
	12400T	6 / 12	1.8 – 4.2 GHz	–	–	18 MB	35 W	DDR4-3200	UHD 730 (1.45 GHz)
Core™ i3	12300	4 / 8	3.5 – 4.4 GHz	–	–	12 MB	60 W	DDR4-3200	UHD 730 (1.45 GHz)
	12300T	4 / 8	2.3 – 4.2 GHz	–	–	12 MB	35 W	DDR4-3200	UHD 730 (1.45 GHz)
	12100	4 / 8	3.3 – 4.3 GHz	–	–	12 MB	60 W	DDR4-3200	UHD 730 (1.45 GHz)
	12100F	4 / 8	3.3 – 4.3 GHz	–	–	12 MB	58 W	DDR4-3200	None
	12100T	4 / 8	2.2 – 4.1 GHz	–	–	12 MB	35 W	DDR4-3200	UHD 730 (1.40 GHz)
Pentium® Gold	G7400	2 / 4	3.7 GHz	–	–	6 MB	46 W	DDR4-3200	UHD 710 (1.35 GHz)
	G7400T	2 / 4	3.1 GHz	–	–	6 MB	35 W	DDR4-3200	UHD 710 (1.35 GHz)
Celeron®	G6900	2 / 2	3.4 GHz	–	–	4 MB	46 W	DDR4-3200	UHD 710 (1.30 GHz)
	G6900T	2 / 2	2.8 GHz	–	–	4 MB	35 W	DDR4-3200	UHD 710 (1.30 GHz)

K = unlocked, **T** = Power optimized lifestyle, **F** = without integrated graphics, Base TDP = Base Thermal Design Power (max. Base Power Consumption).

Note: The Shuttle XPC slim Barebone XH610 does not support the Unlock-function of Intel K-Series processors.
P-Cores: Performance-Cores, E-Cores: Efficient-Cores
Core Clock: the listed core frequency ranges from Base Frequncy to Turbo Frequency (Turbo Boost 3.0 Frequency is not mentioned here)
Base TDF: Processor Base Power dissipation that the processor is validated to not exceed at Base Frequency (Max. Turbo Power is not mentioned here)
Please refer to the support list for detailed processor support information at global.shuttle.com.