

## **Amendment -II**

**Dated: 21.03.2023**

**Subject: Construction of Additional works including Electrical, HVAC and Audio-Visual etc at Geriatrics block, AIIMS, New Delhi.**

**Tender no: HSCC/Geriatrics/Additional /2023.**

Dear Sir,

This has reference to the pre bid meeting held on 10.03.2023 at 15:00 hrs for the captioned subject works,

Please find enclosed the following as an AMENDMENT-II / CLARIFICATION-I :-

1. Annexure-I pertains to clarifications of pre bid queries (list of approved makes and manufacturers).

The above shall be treated as a part of tender to be submitted online duly signed & stamp along with tender.

All other terms & conditions of tender shall remain unchanged.

Prospective bidders are advised to regularly scan through HSCC e-tender portal <https://hscenivida.com> and <http://www.hsccltd.co.in> as corrigendum/amendments etc., if any, will be notified on this portal only and separate advertisement will not be made for this.

**DGM (P), HSCC (I) Ltd.**

**LIST OF APPROVED MAKES : CIVIL WORKS**

S.No	Material	Recommended Makes
1	Doors & Windows fixtures/ Fittings of BRUSHED STEEL	Godrej, Kich , Hafele, Hettich, Gezze
2	Door Closer / Floor spring	Kich, Godrej, Ozone, Hafele, Hardwyn, Gezze
3	Aluminium Sections.	Hindalco, Jindal, Indal, Nalco.
4	Clear Glass/ Clear Float Glass/ Toughened Glass	Saint Gobain, Asahi, Modi Guard,
5	Laminates	Greenlam, Merino, Kitply, Century, Archidply
6	Synthetic Enamel Paints	Asian, Berger, Nerolac.
7	Oil Bound Distemper	Asian, Berger, Nerolac
8	Cement Paint	Snowcem plus, Asian, Berger
9	Plastic Emulsion Paint	Asian, Berger, Nerolac
10	Other Paints/Primers	Asian, Berger , Nerolac, Shalimar
11	OPC 43 Grade Cement (Conforming to IS 8112)	ACC, Ultratech, Jaypee Cement, Century Cement, J.K.Cement, Shree Cement & Ambuja Cement
12	Reinforcement Steel (TMT Bars)	SAIL, RINL, TISCO, JSW, Jindal Steel
13	Rolled Steel Hollow Door Frame	Tata EZYFIT, Apollo Chaukhat.
14	MS Pipe/ Sections	Jindal, Tata, SAIL, RINL, Shyam Steel Industries Limited, APL Apollo
15	Polycarbonate Sheets	GE Plastic, COXWELL, Danpanion India.
16	Wooden Fire Check Doors	Navair, Pacific, Sukriti, Shakti-Hormann
17	Metal Fire Check Doors	Navair. Shakti-Hormann, Godrej, Pacific, Sukriti, TATA.
18	Admixtures for concrete.	CICO, Fosroc, Sika, MC-Bouchemie, Pidilite, BASF, STP, CHRYSO, Supreme Bituchem, Kunal Conchem Pvt. Ltd.
19	Ceramic Tiles	Kajaria, Somany, Naveen, ORIENT (BELL), JOHNSON
20	Pre-Laminated Particle Board	Greenlam, Duro, Merino, Kitlam, Century, ECOBOARD, ARCHID
21	a)Flush Door Shutters	Greenply, Duro, Kitply, Century.
22	b)WPC Flush Doors	ALSTONE and equivalent
23	White Cement	JK White, Birla White, Ultratech, Lafarge
24	Powder Coating Material Pure Polyester	Nerolac, Berger, J&N, Asian
25	Stainless Steel Screws For Fabrication and fixing of Windows.	Hettich, Hafele,Dorma,Gezze, Ozone, Kich, Kundan, Pooja, Atul
26	Dash Fasteners./Anchor bolts, Cramps	Hilti, Fischer, Bosch, Canon, ebco
27	Stainless Steel Friction Stay	Earl-Bihari(ebco),Hafele, Hettich, Ozone
28	Weather Silicon	Dow Corning, Wacker, G.E, Pedilite, Dr. Fixit, Sikka.

29	Structural Silicon at butt joints	Dow Corning, Wacker, G.E, Pedilite, Dr. Fixit, Sikka.
30	Water proofing Compound / applicator	CICO, Fosroc, MC-Bouchemie, Pidilite, Sika, BASF, Chryso
31	Reflective Glass	Saint Gobain, Asahi, Modiguard, Glaverbel
32	Door Locks/Latches	Dorma, Harrison, Yale, Hettich, Godrej.
33	Aluminium Grill	Hindalco, Jindal, Boruka
34	Vitrified Tiles	Kajaria, Somany, Johnson, Naveen, ORIENT (BELL).
35	Aluminium Cladding sheets	Alucobond, Aludecor.
36	Stainless steel D-handles	D-Line, Dorma, Giesse, Ozone, Hettich, Hafele, Godrej
37	Stainless Steel Railing/ pipe/ sheet	Jindal, SAIL,APL Apollo.
38	Structural Steel	TATA, SAIL, RINL, APL Apollo.
39	Ready Mix Concrete	ACC, Ultratech, L&T, Lafarge / As approved by Engineer
40	Epoxy Flooring/ wall coating	Fosroc, BASF, STP, Sika, Dr Beck
41	Acoustic Mineral Fibre	Armstrong, USG, Hunter Douglas, Dexune,
42	Fire Panic bar/ hinges	Briton, Becker FS, Godrej, Hafele, Shakti-Hormann.
43	Plywood/ Block Board	Greenply, Kitply,Kajaria. Merino, Duro, Century
44	PVC Flooring	Gerflor, Tarkett, Armstrong, / As approved by Engineer
45	Fire Seal	Pemco, Lorient, Astroflame, HILTI.
46	Fire rated door closer/Mortice Lock/ Door Co-ordinator	Briton, Becker FS, Godrej, Hafele, Shakti-Hormann.
47	Gypsum Board System	USG- Boral, India Gypsum, Lafarge.
48	Adhesive for Wood Work	Fevicol, Vemicol, Dunlop, Pidilite, Sika.
49	Epoxy/PU Paint	Fosroc, BASF, Sika, Supreme, Laticrete/Ferous.
50	Glass Doors (Motorised)	Hafele, Ozone, Besam, Hettich
51	Automaticaly Hermetically Sealed Sliding (OT) Door	Metaflex, SHD Italia, Stryker.
52	Calcium silicate boards/ Tiles	Hilux, Aerolite, Armstrong,ULTRALITE, USG BORAL, India Gypsum.
53	Texture Paints	Asian, Berger, Nerolac, DULUX, Snowcem
54	Wall care putty	JK, Birla, Berger, Asian Paints.
55	Frameless glass partition fixtures/ Spider fittings/ patch fittings	Dorma, Geze, Ozone, Hafele, Hettich, Assa.
56	U-PVC Windows	Fenesta, VEKA.
57	Toilet Cubicles	Greenlam, Merino, Century.
58	Fire rated Glass	Saint Gobain, Schott, Pyroguard, Ashai
59	Fibre Glass Rigid Board	FGP Ltd., UP Twiga, Kimmco

60	Mineral Wool/ Rockwool	Rockwool India Pvt. Ltd., Lloyd
61	Heat Resistance Tile	Thermatek, National
62	Bitumen	Indian Oil, Hindustan Petroleum, STP Ltd
63	Stainless Steel Door Handles, Locks Fittings	Dorma, D-Line, Harrison, Yale, Hettich, Godrej, ebco.
64	Acid/ Alkali Resistant Tile	Somany, Kajaria, ORIENT (BELL), JOHNSON.
65	Acrylic Exterior Paint	Asian, Berger, Nerolac, J&N
66	WPC Door frame and Shutters	ALSTONE and equivalent
67	Metal False Ceiling	Armstrong, Durlum, Saint Gobain, HUNTER DOUGLAS.
68	Expansion joint	As approved by Engineer In charge
69	Silicon	ALSTONE or equivalent
70	PVC Door frame and Shutters	Rajshri, Sintex.
71	Metal Roofing	Tata, Kalzip, Kingspan, Jindal.
72	UPVC Door/ Window	FENESTA, REHAN, DUROPLAST, GREEN FENESTRATIONS, JANGID ENGINEERING WORKS, ALUPLAST, VEKA As approved by Engineer in charge.
<b>Note</b>	<b>Final choice of make specified or not specified above shall remain with the Engineer in charge</b>	
	<b>Equivalent makes can also be added or deleted, subject to price adjustment if any with approval of Engineer In Charge.</b>	
	<b>Wherever makes have not been specified for certain items, the same shall be as per approval of Engineer</b>	

**LIST OF APPROVED MAKES FOR ELCTRICAL SYSTEM**

Contractor shall use the materials of approved make as indicated below unless specified in BOQ or as approved by the HSCC engineer incharge. The contractor shall ensure the correct selection of the approved make meeting the specifications and application duties. Before placing order for procurement, the sample of approved make shall be got verified for its suitability to the specification and application duty. However, HSCC engineer incharge reserves the right to opt for the best preferred listed make. The contractor shall quote the rates for the material and equipment as per the list of approved makes. In the event of the contractor wants to use alternate makes other than those stipulated for non availability, monopolistic attitude with proof, the contractor can send a proposal after ensuring that what he proposes at the least meets both the quality and safety standard of the stipulated makes, and the financial benefit, if any, that will accrue to the client. He shall also stand full guarantee to his alternate proposal. The alternate makes can be used only after an approval accorded by the client/HSCC., whose decision will be final in this matter.

<b>Sr. No.</b>	<b>ITEM</b>	<b>MAKES</b>
1	Moulded Case Circuit Breaker	L & T – (D sine/DL) / Siemens-VA/ ABB-TMA / Schneider – (NSX) /Legrand-DPX/ GE- Entelliguard
2	MCB distribution Boards	L & T/Hager/Legrand/ Siemens/ Schneider/GE /ABB/ Philips/Havells/
3	RCCB/MCB	L & T / Legrand-DX3/ Siemens / Schenider –Acti 9/GE/ Hager/Philips/Havells/ABB-SB
4	LED Light fitting & Fixture	Philips / GE/ Panasonic /Wipro/Bajaj/ Havells
5	MS conduit & Accessories	BEC/ Atul/ Steel Kraft
6	PVC conduit & Accessories (ISI Marked)	Supreme/Prince/Finolex/BEC/Precision
7	Copper conductor PVC insulated wires, Co-axial , Telephone wires & LV cables	L&T /Havells/Rallision/RR Kabel /Finolex /Skytone /Polycab /KEI
8	Modular Switches & sockets Outlets	Legrand-Myrius or Anti bacterial/L&T-Entice/ Schneider -Opel / Philips -Sleek /ABB(Tvisha)/ Panasonic (Europa)
9	Metal clad Socket outlets With boxes	L & T /Hager/ Siemens/ Schneider/ ABB/Legrand
10	Ceiling fans	Orient/ Usha/ Havells / Bajaj/Alsthom
11	Fire Detection System Addressable	Honeywell-Notifier/Edward/Bosch/ Siemens /Schneider
12	CAT 6 UTP, CAT 6A UTP/STP, Optical Fibre-cable	Molex/Systimax/Panduit/Belden

Equivalent makes can be added with price adjustment with the prior approval of Engineer-in-charge

MAKE LIST AUDIO VISUAL SYSTEM FOR 6TH, 8Th 9th FLOOR , GERIATICS BLOCK , AIIMS- NEW DELHI

Si No	Equipment Type	Approved Makes
1	Display	Samsung, Philips, Sony
2	HDMI Cable, speaker cable etc	Belden,Kramer,Custom
3	HDMI Face plate	Custom
4	Projector	Epson, Barco, christie, Panasonic, Sony
5	Projection Screen	Liberty, Suvira, Dalite, Drapper, Stewart
6	Soft Codec Switcher	Liberty AV,Kramer, Extron
7	Camera switcher, streaming cum recorder	Extron, Lumens, Extron
8	PTZ Camera	QSC, Lumens, Vaddio, Panasonic,Sony
9	Automatic audio mixer	Audio technica, QSC, Shure, Soundcraft, Midas, Yumaha
10	Amplifier	Crown, Bose, Labgruppen
11	Ceiling speakers	Bose,Bosch, , JBL,
12	Wall Mount speakers	Bose,Bosch, JBL,
13	Wireless Hand held mic	Audio Technica, Shure, sennheiser, Beyerdynamic
14	Wireless Lapel Mic	Audio Technica, Shure, sennheiser, Beyerdynamic
15	Gooseneck Microphone	Audio Technica,Bosch, Beyerdynamic, Shure
16	Document Camera	Lumens, Elmo
17	Rack	As per Engineer Incharge
18	Controller	Kramer, Extron, Crestron
19	Wireless Touch panel	Apple, Extron, Crestron, AMX
20	Cable Cubby	Custom, Kramer, Extron
21	DSP	BSS,QSC, Bose,Biamp
22	Matrix Switcher	Liberty AV,Kramer, Extron, Crestron

<b>Technical Specifications fo AIIMS GERIATRIC BLOCK AV SYSTEM</b>		
<b>Small Meeting room</b>		
1	55" Display	
	55" Diagonal size	
	350 Nits Brightness	
	4000:1 Contrast Ratio	
	16/7 Operation	
	HDMI 2.0 X 2 Inputs	
	HDCP2.2	
	USB2.0 X2 Nos inputs	
	Audi Out-Stereo Mini Jack	
	External Control RS 232	
	UHD resolution	
	Support Landscape/Portrait	
2	HDMI CABLE	
	5 Meter in length	
	Should support HDMI 2.0	
3	HDMI Face plate	
	Powder coated	
	HDMI gold plate connector	
<b>Meeting room and sateleti meeting room</b>		
1	Projector	
	RGB Liquid crystal shutter projection system	
	Input:D-Sub 15Pin, HdbaseT X 1, HDMI X 2	
	Output :D-Sub 15Pin: 1 Shared with Computer 2	
	Audio Input :Stereo Mini Jack: 2	
	Audio Output:Stereo Mini Jack: 1	
	Zoom Ratio :1-1.6	
	Throw Ratio:range :1.35 - 2.20 (Wide to Tele)	
	Contrast Ratio :2,500,000:1	
	Native Resolution: WUXGA (1920 x 1200)	
	Direct Power ON/OFF	
	Light Source: Laser Diode	
	Brightness: 5200 Lumens or More	
2	Screen	
	Manual Projection Screen	
	16:9 Aspect ratio	
	109" Diagonal	
	Matte fabric	
3	Soft Codec switcher	
	2 HDMI, 1 DP, 1 USB-C inputs on transmitter plus 1 HDMI input on receiver when used	
	1 HDMI and 1 HDBaseT output up to 70 meters can be mirrored or matrixed	
	USB switching hub built in; features switchable 2 host ports and 2 USB 3.0 client ports. USB-C acts as a 3rd host port.	
	Local switcher supports resolutions up to HDMI 2.0b, 4K/60Hz/4:4:4 8bit deep color	
	Auto Switching with selectable signal sense	
	HDCP2.2 Compliant	
	Fully function USB-C port provides up to 40w charging power when device is locally powered	
	Auto Display control to power on/off display	
4	Camera Switcher, streamer cum recorder	
	4-input video processor (with HDMI and IP)	

	Video Output :3 H.264/AVC digital video over Ethernet 2 HDMI digital video	
	Internal storage :Standard 1TB HDD / Optional 2TB HDD	
	External storage: 1 USB 3.0 port in front panel	
	Audio Input: 4 Line In (stereo, 3.5mm phone jack) 4 stereo, digital de-embedded audio from HDMI IP Audio Source (RTSP, 16K/44.1K/48K)	
	Audio Output: 1 stereo, unbalanced 3.5mm phone jack 2 stereo, digital de-embedded audio from HDMI	
	Control Port :RS-232 / RS-485 port	
	RTSP Scenes Switch Yes, preset for layout, background, and overlay Layout Switch Yes ( Single, PIP, PBP, 3 and 4 windows layouts) Background Switch Yes Overlay Yes, PNG overlay or System time overlay File Backup FTP / SFTP / NAS(CIFS/SMB, NFS) / USB Flash Drive G	
5	<b>PTZ Camera</b>	
	Full HD PTZ Camera	
	1080p 60fps	
	12x optical zoom / 72.5° horizontal field of view	
	Simultaneous HDMI, 3G-SDI, USB, and IP streaming output	
	Sensor :1/2.8" 2MP CMOS	
	Aperture: F1.6~F2.8	
	Focal Length :3.9mm~46.8mm	
	Auto / Manual Gain Control	
	Auto / Manual white Balance	
	Auto framing, Image flip	
	256 presets	
	Control Interfaces: RS-232 / Ethernet / USB 3.0	
6	<b>USB Extender:</b>	
	USB2.0 High Speed extender over category cable	
	extends USB2.0 signals up to 480Mbps up to 100m	
	4 port hub on client side for multiple connected devices	
	Uses any Cat5e/6/6A twisted pair cabling	
7	<b>HDMI Extender:</b>	
	Transmit Video up to 4K30 Multi-Channel Audio, ARC, IR, & CEC over one Category Cable	
	Maximum Transmission Distance: CAT6: 230ft/70m for 1080p, 131ft/40m for 4K30 CAT5E: 197ft/60m for 1080p, 115ft/35m for 4K30	
	Video Resolutions: Supports a full range of resolutions up to 4K30	
	Audio Protocols: up to 7.1ch digital audio	
	Control Protocols: Extend IR and CEC control	
	Compliance: HDMI and HDCP 1.4 backwards compatible	
8	<b>HDMI +USB Active extender set-</b>	
	USB-C transmits audio, video, data and power charging up to 40W	
	Single shielded Cat6/6a cable 4K to 40 meters, 1080P to 70 meters	
	Supports HDCP 2.2 and HDCP 1.4 encryption	
	Supports resolutions up to 4K2K@30Hz (4:4:4) or 4K2K@60Hz (4:2:0) 10.2G	
	Dedicated 3.5mm analog audio channel independent of HDMI	
9	<b>Automatic Audio Mixer:</b>	
	4 balanced mic inputs, 2 balanced Mic/Line inputs and 1 stereo unbalanced input	
	1 stereo and 2 mono outputs	



	2-channel USB audio interface for soft codec (Skype, WebEx) integration or playback from computer	
	Full digital processing on inputs and outputs	
	8 x 3 audio routing matrix	
	6-channel Smart Mix (gate or gain sharing)	
	Onboard acoustic echo canceler (AEC) processing	
	Front panel direct operation and Web Remote functionality	
	IP control for third-party CCS administration	
	Up to 6 mixers can be linked using Cat5e cable	
10	<b>Amplifier:</b>	
	Up to 200 watts per channel into 4 and 8 ohms	
	Frequency response 20 Hz - 20 KHz +/- 0.1 dB	
	Signal to noise (20 Hz - 20 KHz) >100 dB	
	Input connectors 3.5 mm Euro, 5 position (green)	
	Controls 4 ohms/8 ohms/70 V Bridged Highpass On/100 V Bridged Highpass (per channel pair)	
	Highpass filter 80 Hz in Bridged 70 V & 100 V	
	Agency approvals UL, CE, Energy Star, RoHS/WEEE compliant, FCC Class B (Conducted and Radiated emissions), UL 2043 with plenum kit accessory	
11	<b>Ceiling speakers -</b>	
	Rated Power: 20 Watts,	
	- Power Tapping: 20/10/5/2.5W	
	- Effective frequency range(-10 dB) : 70 Hz to 20KHz	
	- SPL at 1w (1Khz at 1 m): 89 dB	
	- Opening Angle 1 KHz / 4 KHz (-6 dB): 180°/72°	
	- Rated Impedance : 500Ohm	
	- Dimensions : 8in	
	- Tweeter: ½ inch poly cone	
	- Operating temperature: -5 °C to +55 °C	
12	<b>Wall Mount speakers -</b>	
	Rated Power: 30W,	
	- Power Tapping: 30/15/7.5/3.75 W	
	- Effective frequency range(-10 dB) : 100 Hz to 18.5KHz	
	- SPL at rated power (1Khz at 1 m): 105dB	
	- SPL at 1w (1Khz at 1 m): 90 dB	
	- Opening Angle Horizontal 1 KHz / 4 KHz (-6 dB): 160°/81°	
	- Opening Angle Vertical 1 KHz / 4 KHz (-6 dB): 150°/90°	
	- Rated Impedance : 333 Ohm	
	- Transducers : 127 mm (5") woofer, 13 mm (0.51 ") dome tweeter	
	- Dimensions (HxWxD) : 250x 60x140 mm	
	- Operating temperature: -25 °C to +55 °C	
	- Relative humidity : <95%	
	- Safety: acc. to EN 60065	
	- Water and dust protection: acc. to EN 60529 IP x4	
	-Self extinguishing: acc. to UL94 V 0	
13	<b>Wireless Hand held microphone:</b>	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	cardioid dynamic microphone element	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz ± 2 dB	
	Signal to noise ratio :> 100 dB A-Weighted	

	UHF wireless system	
14	Wireless lapel microphone:	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	directional lavalier microphone	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz $\pm$ 2 dB	
	Cardiod polar pattern	
	UHF wireless system	
	16MHz frequency range	
15	Goose neck microphone :	
	Unidirectional condenser microphone	
	Flexible stem	
	Phantom powered by amplifier	
	On/off sliding switch with priority contact	
	Sensitivity :0.7 mV @ 85 dB SPL (2 mV/Pa)	
	Frequency response 100 Hz to 16 kHz	
16	Document camera :	
	UltraHD resolution at 30fps	
	HDMI and USB output	
	Portable, lightweight design with flexible gooseneck	
	Hands-free auto-focus and image optimization	
	USB plug and play design	
	Compatible with most whiteboards	
	1/3" 13MP CMOS Color Image Sensor	
	XGA / 720p / 1080p / 4K (2160p)	
	30x digital zoom	
	HDMI x1 / USB 2.0	
	Built in microphone	
17	Rack:	
	18U	
	Required shelves, castor wheels, glass doors, power strips, exhaust fans etc	

	Seminar Room	
1	Projector-	
	<b>Projection Technology:</b> RGB liquid crystal shutter projection system	
	<b>Interface:</b> 2 x VGA, with Audio, 2 x HDMI, 1 x HDMI Out, RS-232, USB Type A & B, Ethernet Port, HD-Base-T port , Audio out & Wireless LAN	
	<b>Zoom Ratio:</b> 1-1.6 (Manual)	
	<b>Contrast Ratio:</b> 2,500,000:1	
	<b>Direct Power On/Off:</b> Yes	
	<b>Lightsource:</b> Type: Laser Diode	
	Brightness: 7000 Lumens or More	
	<b>Aspect Ratio:</b> 16:10	
2	Motorised projection screen :	
	150" diagonal	
	Aspect Ratio:16:10	
3	Soft Codec switcher:	
	2 HDMI, 1 DP, 1 USB-C inputs on transmitter plus 1 HDMI input on receiver when used	
	1 HDMI and 1 HDBaseT output up to 70 meters can be mirrored or matrixed	
	USB switching hub built in; features switchable 2 host ports and 2 USB 3.0 client ports. USB-C acts as a 3rd host port.	
	Local switcher supports resolutions up to HDMI 2.0b, 4K/60Hz/4:4:4 8bit deep color	
	Auto Switching with selectable signal sense	
	HDCP2.2 Compliant	
	Fully function USB-C port provides up to 40w charging power when device is locally powered	
	Auto Display control to power on/off display	
4	Camera Switcher, streamer cum recorder	
	4-input video processor (with HDMI and IP)	
	Video Output :3 H.264/AVC digital video over Ethernet 2 HDMI digital video	
	Internal storage :Standard 1TB HDD / Optional 2TB HDD	
	External storage: 1 USB 3.0 port in front panel	
	Audio Input: 4 Line In (stereo, 3.5mm phone jack) 4 stereo, digital de-embedded audio from HDMI IP Audio Source (RTSP, 16K/44.1K/48K)	
	Audio Output: 1 stereo, unbalanced 3.5mm phone jack 2 stereo, digital de-embedded audio from HDMI	
	Control Port :RS-232 / RS-485 port	
	RTSP Scenes Switch Yes, preset for layout, background, and overlay Layout Switch Yes ( Single, PIP, PBP, 3 and 4 windows layouts) Background Switch Yes Overlay Yes, PNG overlay or System time overlay File Backup FTP / SFTP / NAS(CIFS/SMB, NFS) / USB Flash Drive G	
5	PTZ Camera:	
	Full HD PTZ Camera	
	1080p 60fps	
	12x optical zoom / 72.5° horizontal field of view	
	Simultaneous HDMI, 3G-SDI, USB, and IP streaming output	
	Sensor :1/2.8" 2MP CMOS	
	Aperture: F1.6~F2.8	
	Focal Length :3.9mm~46.8mm	
	Auto / Manual Gain Control	
	Auto / Manual white Balance	
	Auto framing, Image flip	

	256 presets	
	Control Interfaces: RS-232 / Ethernet / USB 3.0	
6	<b>USB Extender:</b>	
	USB2.0 High Speed extender over category cable	
	extends USB2.0 signals up to 480Mbps up to 100m	
	4 port hub on client side for multiple connected devices	
	Uses any Cat5e/6/6A twisted pair cabling	
7	<b>HDMI Extender:</b>	
	Transmit Video up to 4K30 Multi-Channel Audio, ARC, IR, & CEC over one Category Cable	
	Maximum Transmission Distance: CAT6: 230ft/70m for 1080p, 131ft/40m for 4K30 CAT5E: 197ft/60m for 1080p, 115ft/35m for 4K30	
	Video Resolutions: Supports a full range of resolutions up to 4K30	
	Audio Protocols: up to 7.1ch digital audio	
	Control Protocols: Extend IR and CEC control	
	Compliance: HDMI and HDCP 1.4 backwards compatible	
8	<b>HDMI +USB AActive extender set-</b>	
	USB-C transmits audio, video, data and power charging up to 40W	
	Single shielded Cat6/6a cable 4K to 40 meters, 1080P to 70 meters	
	Supports HDCP 2.2 and HDCP 1.4 encryption	
	Supports resolutions up to 4K2K@30Hz (4:4:4) or 4K2K@60Hz (4:2:0) 10.2G	
	Dedicated 3.5mm analog audio channel independent of HDMI	
9	<b>Automatic Audio Mixer:</b>	
	4 balanced mic inputs, 2 balanced Mic/Line inputs and 1 stereo unbalanced input	
	1 stereo and 2 mono outputs	
	2-channel USB audio interface for soft codec (Skype, WebEx) integration or playback from computer	
	Full digital processing on inputs and outputs	
	8 x 3 audio routing matrix	
	6-channel Smart Mix (gate or gain sharing)	
	Onboard acoustic echo canceler (AEC) processing	
	Front panel direct operation and Web Remote functionality	
	IP control for third-party CCS administration	
	Up to 6 mixers can be linked using Cat5e cable	
10	<b>Amplifier:</b>	
	Up to 200 watts per channel into 4 and 8 ohms	
	Frequency response 20 Hz - 20 KHz +/- 0.1 dB	
	Signal to noise (20 Hz - 20 KHz) >100 dB	
	Input connectors 3.5 mm Euro, 5 position (green)	
	Controls 4 ohms/8 ohms/70 V Bridged Highpass On/100 V Bridged Highpass (per channel pair)	
	Highpass filter 80 Hz in Bridged 70 V & 100 V	
	Agency approvals UL, CE, Energy Star, RoHS/WEEE compliant, FCC Class B (Conducted and Radiated emissions), UL 2043 with plenum kit accessory	
11	<b>Ceiling speakers -</b>	
	Rated Power: 20 Watts,	
	- Power Tapping: 20/10/5/2.5W	
	- Effective frequency range(-10 dB) : 70 Hz to 20KHz	
	- SPL at 1w (1Khz at 1 m): 89 dB	
	- Opening Angle 1 KHz / 4 KHz (-6 dB): 180°/72°	
	- Rated Impedance : 500Ohm	

	- Dimensions : 8in	
	- Tweeter: ½ inch poly cone	
	- Operating temperature: -5 °C to +55 °C	
12	Wall Mount speakers -	
	Rated Power: 30W,	
	- Power Tapping: 30/15/7.5/3.75 W	
	- Effective frequency range(-10 dB) : 100 Hz to 18.5KHz	
	- SPL at rated power (1Khz at 1 m): 105dB	
	- SPL at 1w (1Khz at 1 m): 90 dB	
	- Opening Angle Horizontal 1 KHz / 4 KHz (-6 dB): 160°/81°	
	- Opening Angle Vertical 1 KHz / 4 KHz (-6 dB): 150°/90°	
	- Rated Impedance : 333 Ohm	
	- Transducers : 127 mm (5") woofer, 13 mm (0.51 ") dome tweeter	
	- Dimensions (HxWxD) : 250x 60x140 mm	
	- Operating temperature: -25 °C to +55 °C	
	- Relative humidity : <95%	
	- Safety: acc. to EN 60065	
	- Water and dust protection: acc. to EN 60529 IP x4	
	-Self extinguishing: acc. to UL94 V 0	
13	Wireless Hand held microphone:	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	cardioid dynamic microphone element	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz ± 2 dB	
	Signal to noise ratio :> 100 dB A-Weighted	
	UHF wireless system	
14	Wireless lapel microphone:	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	directional lavalier microphone	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz ± 2 dB	
	Cardiod polar pattern	
	UHF wireless system	
	16MHz frequency range	
15	Goose neck microphone :	
	Unidirectional condenser microphone	
	Flexible stem	
	Phantom powered by amplifier	
	On/off sliding switch with priority contact	
	Sensivity :0.7 mV @ 85 dB SPL (2 mV/Pa)	
	Frequency response 100 Hz to 16 kHz	
16	Document camera :	
	UltraHD resolution at 30fps	
	HDMI and USB output	
	Portable, lightweight design with flexible gooseneck	
	Hands-free auto-focus and image optimization	
	USB plug and play design	

	Compatible with most whiteboards	
	1/3" 13MP CMOS Color Image Sensor	
	XGA / 720p / 1080p / 4K (2160p)	
	30x digital zoom	
	HDMI x1 / USB 2.0	
	Built in microphone	
17	<b>Controller :</b>	
	8 RS - 232 serial on 3 - pin terminal blocks, 8 GPI/O on 2 - pin terminal blocks, 1 Ethernet on a RJ - 45 connector, 1 micro - USB connector for sending P3K commands and performing a firmware upgrade	
	1 built - in IR sensor (for learning)	
	8 IR out and 8 relays on 2 - pin terminal block connectors	
	512MB RAM, 4GB Flash Memory	
	LED indicator for each port and function	
18	<b>Wireless touch panel :</b>	
	32 GB Memory	
	WIFI Only	
	10.2-inch panel	
19	<b>Rack:</b>	
	18U	
	Required shelves, castor wheels, glass doors, power strips, exhaust fans etc	
	Quality assurance lab, stem cell, molecular room, student research room, cardiology area	
1	<b>Projector-</b>	
	<b>Projection Technology:</b> RGB liquid crystal shutter projection system	
	<b>Interface:</b> 2 x VGA, with Audio, 2 x HDMI, 1 x HDMI Out, RS-232, USB Type A & B, Ethernet Port, HD-Base-T port , Audio out & Wireless LAN	
	<b>Zoom Ratio:</b> 1-1.6 (Manual)	
	<b>Contrast Ratio:</b> 2,500,000:1	
	<b>Direct Power On/Off:</b> Yes	
	<b>Lightsource:</b> Type: Laser Diode	
	Brightness: 7000 Lumens or More	
	<b>Aspect Ratio:</b> 16:10	
2	<b>Motorised projection screen :</b>	
	150" diagonal	
	Aspect Ratio:16:10	
3	<b>Soft Codec switcher:</b>	
	2 HDMI, 1 DP, 1 USB-C inputs on transmitter plus 1 HDMI input on receiver when used	
	1 HDMI and 1 HDBaseT output up to 70 meters can be mirrored or matrixed	
	USB switching hub built in; features switchable 2 host ports and 2 USB 3.0 client ports. USB-C acts as a 3rd host port.	
	Local switcher supports resolutions up to HDMI 2.0b, 4K/60Hz/4:4:4 8bit deep color	
	Auto Switching with selectable signal sense	
	HDCP2.2 Compliant	
	Fully function USB-C port provides up to 40w charging power when device is locally powered	
	Auto Display control to power on/off display	
4	<b>Camera Switcher, streamer cum recorder</b>	
	4-input video processor (with HDMI and IP)	

	Video Output :3 H.264/AVC digital video over Ethernet 2 HDMI digital video	
	Internal storage :Standard 1TB HDD / Optional 2TB HDD	
	External storage: 1 USB 3.0 port in front panel	
	Audio Input: 4 Line In (stereo, 3.5mm phone jack) 4 stereo, digital de-embedded audio from HDMI IP Audio Source (RTSP, 16K/44.1K/48K)	
	Audio Output: 1 stereo, unbalanced 3.5mm phone jack 2 stereo, digital de-embedded audio from HDMI	
	Control Port :RS-232 / RS-485 port	
	RTSP Scenes Switch Yes, preset for layout, background, and overlay Layout Switch Yes ( Single, PIP, PBP, 3 and 4 windows layouts) Background Switch Yes Overlay Yes, PNG overlay or System time overlay File Backup FTP / SFTP / NAS(CIFS/SMB, NFS) / USB Flash Drive G	
5	<b>PTZ Camera:</b>	
	Full HD PTZ Camera	
	1080p 60fps	
	12x optical zoom / 72.5° horizontal field of view	
	Simultaneous HDMI, 3G-SDI, USB, and IP streaming output	
	Sensor :1/2.8" 2MP CMOS	
	Aperture: F1.6~F2.8	
	Focal Length :3.9mm~46.8mm	
	Auto / Manual Gain Control	
	Auto / Manual white Balance	
	Auto framing, Image flip	
	256 presets	
	Control Interfaces: RS-232 / Ethernet / USB 3.0	
6	<b>USB Extender:</b>	
	USB2.0 High Speed extender over category cable	
	extends USB2.0 signals up to 480Mbps up to 100m	
	4 port hub on client side for multiple connected devices	
	Uses any Cat5e/6/6A twisted pair cabling	
7	<b>HDMI Extender:</b>	
	Transmit Video up to 4K30 Multi-Channel Audio, ARC, IR, & CEC over one Category Cable	
	Maximum Transmission Distance: CAT6: 230ft/70m for 1080p, 131ft/40m for 4K30 CAT5E: 197ft/60m for 1080p, 115ft/35m for 4K30	
	Video Resolutions: Supports a full range of resolutions up to 4K30	
	Audio Protocols: up to 7.1ch digital audio	
	Control Protocols: Extend IR and CEC control	
	Compliance: HDMI and HDCP 1.4 backwards compatible	
8	<b>HDMI +USB Active extender set-</b>	
	USB-C transmits audio, video, data and power charging up to 40W	
	Single shielded Cat6/6a cable 4K to 40 meters, 1080P to 70 meters	
	Supports HDCP 2.2 and HDCP 1.4 encryption	
	Supports resolutions up to 4K2K@30Hz (4:4:4) or 4K2K@60Hz (4:2:0) 10.2G	
	Dedicated 3.5mm analog audio channel independent of HDMI	
9	<b>Automatic Audio Mixer:</b>	
	4 balanced mic inputs, 2 balanced Mic/Line inputs and 1 stereo unbalanced input	
	1 stereo and 2 mono outputs	

	2-channel USB audio interface for soft codec (Skype, WebEx) integration or playback from computer	
	Full digital processing on inputs and outputs	
	8 x 3 audio routing matrix	
	6-channel Smart Mix (gate or gain sharing)	
	Onboard acoustic echo canceler (AEC) processing	
	Front panel direct operation and Web Remote functionality	
	IP control for third-party CCS administration	
	Up to 6 mixers can be linked using Cat5e cable	
10	<b>Amplifier:</b>	
	Up to 200 watts per channel into 4 and 8 ohms	
	Frequency response 20 Hz - 20 KHz +/- 0.1 dB	
	Signal to noise (20 Hz - 20 KHz) >100 dB	
	Input connectors 3.5 mm Euro, 5 position (green)	
	Controls 4 ohms/8 ohms/70 V Bridged Highpass On/100 V Bridged Highpass (per channel pair)	
	Highpass filter 80 Hz in Bridged 70 V & 100 V	
	Agency approvals UL, CE, Energy Star, RoHS/WEEE compliant, FCC Class B (Conducted and Radiated emissions), UL 2043 with plenum kit accessory	
11	<b>Ceiling speakers</b>	
	Rated Power: 20 Watts,	
	- Power Tapping: 20/10/5/2.5W	
	- Effective frequency range(-10 dB) : 70 Hz to 20KHz	
	- SPL at 1w (1Khz at 1 m): 89 dB	
	- Opening Angle 1 KHz / 4 KHz (-6 dB): 180°/72°	
	- Rated Impedance : 500Ohm	
	- Dimensions : 8in	
	- Tweeter: ½ inch poly cone	
	- Operating temperature: -5 °C to +55 °C	
12	<b>Wall Mount speakers -</b>	
	Rated Power: 30W,	
	- Power Tapping: 30/15/7.5/3.75 W	
	- Effective frequency range(-10 dB) : 100 Hz to 18.5KHz	
	- SPL at rated power (1Khz at 1 m): 105dB	
	- SPL at 1w (1Khz at 1 m): 90 dB	
	- Opening Angle Horizontal 1 KHz / 4 KHz (-6 dB): 160°/81°	
	- Opening Angle Vertical 1 KHz / 4 KHz (-6 dB): 150°/90°	
	- Rated Impedance : 333 Ohm	
	- Transducers : 127 mm (5") woofer, 13 mm (0.51 ") dome tweeter	
	- Dimensions (HxWxD) : 250x 60x140 mm	
	- Operating temperature: -25 °C to +55 °C	
	- Relative humidity : <95%	
	- Safety: acc. to EN 60065	
	- Water and dust protection: acc. to EN 60529 IP x4	
	-Self extinguishing: acc. to UL94 V 0	
13	<b>Wireless Hand held microphone:</b>	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	cardioid dynamic microphone element	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz ± 2 dB	



	Signal to noise ratio :-> 100 dB A-Weighted	
	UHF wireless system	
14	Wireless lapel microphone:	
	ClearScan automatically finds the clearest channel	
	one-step channel setup	
	directional lavalier microphone	
	14 hour battery life from two AA alkaline	
	Rugged metal transmitter	
	Metal receiver chassis with optional rack mount	
	32 Channel	
	Frequency response : 80 Hz - 18 kHz $\pm$ 2 dB	
	Cardiod polar pattern	
	UHF wireless system	
	16MHz frequency range	
15	Goose neck microphone :	
	Unidirectional condenser microphone	
	Flexible stem	
	Phantom powered by amplifier	
	On/off sliding switch with priority contact	
	Sensitivity :0.7 mV @ 85 dB SPL (2 mV/Pa)	
	Frequency response 100 Hz to 16 kHz	
16	Document camera :	
	UltraHD resolution at 30fps	
	HDMI and USB output	
	Portable, lightweight design with flexible gooseneck	
	Hands-free auto-focus and image optimization	
	USB plug and play design	
	Compatible with most whiteboards	
	1/3" 13MP CMOS Color Image Sensor	
	XGA / 720p / 1080p / 4K (2160p)	
	30x digital zoom	
	HDMI x1 / USB 2.0	
	Built in microphone	
17	Rack:	
	18U	
	Required shelves, castor wheels, glass doors, power strips, exhaust fans etc	
	<b>Board Room</b>	
1	75" Display-Approved Makes LG, Samsung, Philips	
	75" Diagonal size	
	350 Nits Brightness	
	4000:1 Contrast Ratio	
	16/7 Operation	
	HDMI 2.0 X 3 Inputs	
	HDCP2.2	
	USB2.0 X2 inputs	
	Audi Out-Stereo Mini Jack	
	External Control RS 232	
	UHD resolution	
2	Soft Codec switcher:	
	2 HDMI, 1 DP, 1 USB-C inputs on transmitter plus 1 HDMI input on receiver when used	
	1 HDMI and 1 HDBaseT output up to 70 meters can be mirrored or matrixed	

	USB switching hub built in; features switchable 2 host ports and 2 USB 3.0 client ports. USB-C acts as a 3rd host port.	
	Local switcher supports resolutions up to HDMI 2.0b, 4K/60Hz/4:4:4 8bit deep color	
	Auto Switching with selectable signal sense	
	HDCP2.2 Compliant	
	Fully function USB-C port provides up to 40w charging power when device is locally powered	
	Auto Display control to power on/off display	
<b>3</b>	<b>PTZ Camera:</b>	
	Full HD PTZ Camera	
	1080p 60fps	
	12x optical zoom / 72.5° horizontal field of view	
	Simultaneous HDMI, 3G-SDI, USB, and IP streaming output	
	Sensor :1/2.8" 2MP CMOS	
	Aperture: F1.6~F2.8	
	Focal Length :3.9mm~46.8mm	
	Auto / Manual Gain Control	
	Auto / Manual white Balance	
	Auto framing, Image flip	
	256 presets	
	Control Interfaces: RS-232 / Ethernet / USB 3.0	
<b>4</b>	<b>Cable cubby :</b>	
	Rectangular Retractable Lid Modular Design	
	Black, anodized	
	2 universal power sockets	
	1 USB	
	1 HDMI	
<b>5</b>	<b>USB Extender:</b>	
	USB2.0 High Speed extender over category cable	
	extends USB2.0 signals up to 480Mbps up to 100m	
	4 port hub on client side for multiple connected devices	
	Uses any Cat5e/6/6A twisted pair cabling	
<b>6</b>	<b>Matrix Switcher:</b>	
	4 x HDMI in, 4 x HDMI out	
	All HDMI I/O support full 18G 4K@60Hz 4:4:4 HDCP 2.2 and 4K HDR	
	Analog and digital de-embedded audio outputs	
	Audio outputs can follow video or be routed independently	
	Built in web server control	
	Supports IR, RS232 and IP control	
	Manual DIP switch for EDID management	
	Web control features advanced independent EDID control for each HDMI input	
<b>7</b>	<b>HDMI Extender:</b>	
	Transmit Video up to 4K30 Multi-Channel Audio, ARC, IR, & CEC over one Category Cable	
	Maximum Transmission Distance: CAT6: 230ft/70m for 1080p, 131ft/40m for 4K30 CAT5E: 197ft/60m for 1080p, 115ft/35m for 4K30	
	Video Resolutions: Supports a full range of resolutions up to 4K30	
	Audio Protocols: up to 7.1ch digital audio	
	Control Protocols: Extend IR and CEC control	
	Compliance: HDMI and HDCP 1.4 backwards compatible	

8	DSP :	
	<ul style="list-style-type: none"> <li>• 128 x 128 channels of Q-LAN™ network audio in single channel streams )</li> <li>• Includes 8 x 8 Software-based Dante channels (licensable up to 32 x 32</li> <li>• 24 channels of analog I/O, including 8 configurable Flex channels</li> <li>• Up to 16 assignable and routeable AEC processor instances</li> <li>• Dual Gigabit Ethernet ports with assignable application resources offering any combination of VoIPQ-LAN Control, Q-LAN audio or network redundancy</li> <li>• USB AV bridging (16 x 16 audio + Q-SYS camera support)</li> </ul>	
	POTS telephone interface via a standard RJ-11 connector	
	Supports up to 4 VoIP Softphone instances in addition to the onboard POTS telephone interface	
9	Amplifier:	
	Up to 200 watts per channel into 4 and 8 ohms	
	Frequency response 20 Hz - 20 KHz +/- 0.1 dB	
	Signal to noise (20 Hz - 20 KHz) >100 dB	
	Input connectors 3.5 mm Euro, 5 position (green)	
	Controls 4 ohms/8 ohms/70 V Bridged Highpass On/100 V Bridged Highpass (per channel pair)	
	Highpass filter 80 Hz in Bridged 70 V & 100 V	
	Agency approvals UL, CE, Energy Star, RoHS/WEEE compliant, FCC Class B (Conducted and Radiated emissions), UL 2043 with plenum kit accessory	
10	Ceiling speakers -	
	Rated Power: 20 Watts,	
	- Power Tapping: 20/10/5/2.5W	
	- Effective frequency range(-10 dB) : 70 Hz to 20KHz	
	- SPL at 1w (1Khz at 1 m): 89 dB	
	- Opening Angle 1 KHz / 4 KHz (-6 dB): 180°/72°	
	- Rated Impedance : 500Ohm	
	- Dimensions : 8in	
	- Tweeter: ½ inch poly cone	
	- Operating temperature: -5 °C to +55 °C	
11	Wall Mount speakers -	
	Rated Power: 30W,	
	- Power Tapping: 30/15/7.5/3.75 W	
	- Effective frequency range(-10 dB) : 100 Hz to 18.5KHz	
	- SPL at rated power (1Khz at 1 m): 105dB	
	- SPL at 1w (1Khz at 1 m): 90 dB	
	- Opening Angle Horizontal 1 KHz / 4 KHz (-6 dB): 160°/81°	
	- Opening Angle Vertical 1 KHz / 4 KHz (-6 dB): 150°/90°	
	- Rated Impedance : 333 Ohm	
	- Transducers : 127 mm (5") woofer, 13 mm (0.51 ") dome tweeter	
	- Dimensions (HxWxD) : 250x 60x140 mm	
	- Operating temperature: -25 °C to +55 °C	
	- Relative humidity : <95%	
	- Safety: acc. to EN 60065	
	- Water and dust protection: acc. to EN 60529 IP x4	
	-Self extinguishing: acc. to UL94 V 0	
12	Goose neck microphone :	
	Unidirectional condenser microphone	
	Flexible stem	
	Phantom powered by amplifier	
	On/off sliding switch with priority contact	

	Sensitivity :0.7 mV @ 85 dB SPL (2 mV/Pa)	
	Frequency response 100 Hz to 16 kHz	
13	<b>Controller :</b>	
	4 RS-232 serial on 3-pin terminal blocks, 4 GPI/O on 2-pin terminal blocks, 1 Ethernet on a RJ-45 connector, 1 mini-USB connector for firmware upgrade	
	1 built-in IR sensor (for learning)	
	4 IR out and 4 relays on 2-pin terminal block connectors	
	LED indicator for each port and function	
	512MB RAM, 4GB Flash memory	
14	<b>Wireless touch panel :</b>	
	32 GB Memory	
	WIFI Only	
	10.2-inch panel	
15	<b>Rack:</b>	
	18U	
	Required shelves, castor wheels, glass doors, power strips, exhaust fans etc	
	<b>Conference room</b>	
1	<b>75" Display-</b>	
	75" Diagonal size	
	350 Nits Brightness	
	4000:1 Contrast Ratio	
	16/7 Operation	
	HDMI 2.0 X 3 Inputs	
	HDCP2.2	
	USB2.0 X2 inputs	
	Audi Out-Stereo Mini Jack	
	External Control RS 232	
	UHD resolution	
2	<b>Soft Codec switcher:</b>	
	2 HDMI, 1 DP, 1 USB-C inputs on transmitter plus 1 HDMI input on receiver when used	
	1 HDMI and 1 HDBaseT output up to 70 meters can be mirrored or matrixed	
	USB switching hub built in; features switchable 2 host ports and 2 USB 3.0 client ports. USB-C acts as a 3rd host port.	
	Local switcher supports resolutions up to HDMI 2.0b, 4K/60Hz/4:4:4 8bit deep color	
	Auto Switching with selectable signal sense	
	HDCP2.2 Compliant	
	Fully function USB-C port provides up to 40w charging power when device is locally powered	
	Auto Display control to power on/off display	
3	<b>PTZ Camera:</b>	
	Full HD PTZ Camera	
	1080p 60fps	
	12x optical zoom / 72.5° horizontal field of view	
	Simultaneous HDMI, 3G-SDI, USB, and IP streaming output	
	Sensor :1/2.8" 2MP CMOS	
	Aperture: F1.6~F2.8	
	Focal Length :3.9mm~46.8mm	
	Auto / Manual Gain Control	
	Auto / Manual white Balance	
	Auto framing, Image flip	

	256 presets	
	Control Interfaces: RS-232 / Ethernet / USB 3.0	
4	<b>Cable cubby :</b>	
	Rectangular	
	Retractable Lid	
	Modular Design	
	Black, anodized	
	2 universal power sockets	
	1 USB	
	1 HDMI	
5	<b>USB Extender:</b>	
	USB2.0 High Speed extender over category cable	
	extends USB2.0 signals up to 480Mbps up to 100m	
	4 port hub on client side for multiple connected devices	
	Uses any Cat5e/6/6A twisted pair cabling	
6	<b>Matrix Switcher:</b>	
	4 x HDMI in, 4 x HDMI out	
	All HDMI I/O support full 18G 4K@60Hz 4:4:4 HDCP 2.2 and 4K HDR	
	Analog and digital de-embedded audio outputs	
	Audio outputs can follow video or be routed independently	
	Built in web server control	
	Supports IR, RS232 and IP control	
	Manual DIP switch for EDID management	
	Web control features advanced independent EDID control for each HDMI input	
7	<b>HDMI Extender:</b>	
	Transmit Video up to 4K30 Multi-Channel Audio, ARC, IR, & CEC over one Category Cable	
	Maximum Transmission Distance: CAT6: 230ft/70m for 1080p, 131ft/40m for 4K30 CAT5E: 197ft/60m for 1080p, 115ft/35m for 4K30	
	Video Resolutions: Supports a full range of resolutions up to 4K30	
	Audio Protocols: up to 7.1ch digital audio	
	Control Protocols: Extend IR and CEC control	
	Compliance: HDMI and HDCP 1.4 backwards compatible	
8	<b>DSP :</b>	
	• 128 x 128 channels of Q-LAN™ network audio in single channel streams )	
	• Includes 8 x 8 Software-based Dante channels (licensable up to 32 x 32	
	• 24 channels of analog I/O, including 8 configurable Flex channels	
	• Up to 16 assignable and routeable AEC processor instances	
	• Dual Gigabit Ethernet ports with assignable application resources offering any combination of VoIPQ-LAN Control, Q-LAN audio or network redundancy	
	• USB AV bridging (16 x 16 audio + Q-SYS camera support)	
	POTS telephone interface via a standard RJ-11 connector	
	Supports up to 4 VoIP Softphone instances in addition to the onboard POTS telephone interface	
9	<b>Amplifier:</b>	
	Up to 200 watts per channel into 4 and 8 ohms	
	Frequency response 20 Hz - 20 KHz +/- 0.1 dB	
	Signal to noise (20 Hz - 20 KHz) >100 dB	
	Input connectors 3.5 mm Euro, 5 position (green)	
	Controls 4 ohms/8 ohms/70 V Bridged Highpass On/100 V Bridged Highpass (per channel pair)	

	Highpass filter 80 Hz in Bridged 70 V & 100 V	
	Agency approvals UL, CE, Energy Star, RoHS/WEEE compliant, FCC Class B (Conducted and Radiated emissions), UL 2043 with plenum kit accessory	
10	Ceiling speakers	
	Rated Power: 20 Watts,	
	- Power Tapping: 20/10/5/2.5W	
	- Effective frequency range(-10 dB) : 70 Hz to 20KHz	
	- SPL at 1w (1Khz at 1 m): 89 dB	
	- Opening Angle 1 KHz / 4 KHz (-6 dB): 180°/72°	
	- Rated Impedance : 500Ohm	
	- Dimensions : 8in	
	- Tweeter: ½ inch poly cone	
	- Operating temperature: -5 °C to +55 °C	
11	Wall Mount speakers -	
	Rated Power: 30W,	
	- Power Tapping: 30/15/7.5/3.75 W	
	- Effective frequency range(-10 dB) : 100 Hz to 18.5KHz	
	- SPL at rated power (1Khz at 1 m): 105dB	
	- SPL at 1w (1Khz at 1 m): 90 dB	
	- Opening Angle Horizontal 1 KHz / 4 KHz (-6 dB): 160°/81°	
	- Opening Angle Vertical 1 KHz / 4 KHz (-6 dB): 150°/90°	
	- Rated Impedance : 333 Ohm	
	- Transducers : 127 mm (5") woofer, 13 mm (0.51 ") dome tweeter	
	- Dimensions (HxWxD) : 250x 60x140 mm	
	- Operating temperature: -25 °C to +55 °C	
	- Relative humidity : <95%	
	- Safety: acc. to EN 60065	
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	-Self extinguishing: acc. to UL94 V 0	
12	Goose neck microphone :	
	Unidirectional condenser microphone	
	Flexible stem	
	Phantom powered by amplifier	
	On/off sliding switch with priority contact	
	Sensitivity :0.7 mV @ 85 dB SPL (2 mV/Pa)	
	Frequency response 100 Hz to 16 kHz	
13	Controller :	
	4 RS-232 serial on 3-pin terminal blocks, 4 GPI/O on 2-pin terminal blocks, 1 Ethernet on a RJ-45 connector, 1 mini-USB connector for firmware upgrade	
	1 built-in IR sensor (for learning)	
	4 IR out and 4 relays on 2-pin terminal block connectors	
	LED indicator for each port and function	
	512MB RAM, 4GB Flash memory	
14	Wireless touch panel :	
	32 GB Memory	
	WIFI Only	
	10.2-inch panel ☒	
15	Rack:	
	18U	
	Required shelves, castor wheels, glass doors, power strips, exhaust fans etc	

**LIST OF APPROVED MAKES : HVAC Works for NCA (Geriatric Block), New Delhi**

S.No	Materials	PROPOSED MAKE
1	Centrifugal /Screw/Scroll Chilling Units with VFD (ARI Certified)	Carrier/ Trane/ York /Dunham bush /Kirloskar/Daikin/Voltas/Bluestar
2	Heat Pump	Carrier/ Trane/ York /Dunham bush /Kirloskar/Daikin/Voltas/ Bluestar/Climaveneta/
3	Primary Chilled water/Secondary/ Chilled water Condenser Water/Hot water Pumps	Xylem/Grundfoss/Armstrong/wilo-Mather & Platt
4	Pumps Monoblock	Kirloskar/Beacon/Siemens/KSB/Greaves
5	VFD with controls	Xylem/ Danfoss/ Grundfoss/ Wilo-Mather Platt/ Armstrong
6	Cooling Towers (CTI Approved)	Paharpur/Bell/Mihir/Marley/Advance/Baltimore
7	Electric hot water generator	Rapid cool/ Emerald/ Khokhar
8	Air Handling Units (High Static) with cooling coils	Carrier/Caryaire/Blue-star/Systemair/Voltas/VTS/ Flaktwood/ Waves/Edgtech /Zeco
9	Centrifugal Fan for AHU's	Nicotra/ Comefri/ Flakt/ Kruger/VTS/Systemair
10	VFD for AHU	Danfoss/ Siemens/ ABB, Schneider
11	Ultra Violet Germicidal Irradiation/ PHI	Ruks/Trimed/RGF/Steril-Aire
12	Fan Coil Units	Same as AHU
13	Air washer	Ambassador/Humidin/ Roots Cooling/ Ambiator/ and same as AHU
14	Scrubber (Wet/Dry)	Wet : same as AHU, Dry: Espair/Trion/Thermax/ Rydair
15	Humidifier	Rapid cool/Emerald/Khokhar
16	Fan section	Same as AHU
17	Centrifugal/Axial Flow Fans/Tube Axial(AMCA Certified)	Flakt/ Nicotra/ Kruger /System air /Air flow/ Comefri
18	Propeller Fans	GEC (Alsthom)/ Khaitan/Usha/Marathon/ Bajaj/Havells
19	Precision AC units	Emerson/ Blue box/ Stulz/ Hiross/Voltas/Bluestar/Carrier/Hitachi
20	Window/split AC	Hitachi/ Daikin/ O-general /Voltas/ Bluestar/Carrier/Lloyd/ Samsung/ LG
21	VRV/VRF	Hitachi/Daikin//Toshiba/Mitsubishi Electric /Voltas/Bluestar/Carrier/ Samsung
22	Inline Fans	Flakt/ Nicotra/ Comefri/ Kruger/ SystemAir/Ostberg/Airflow
23	Heat recovery unit complete with Heat recovery wheel	Flaktwoods/ Novelaire/ DRI/ Greenheck/ Bryair
24	Main AC Panel	Siemens (Sepan 8PU)/ L&T (TI)/ABB (Artuk)/Schneider (Block set)/Legrand (XL3)
25	AHU/ventilation electrical panels	Tricolite/ Adlec/ Sterling & Wilson/ Control & Switchgear/ SPC Electrotech/ Risha Control Engineers Pvt. Ltd. /Milestone/ Advance Panel/ KEPL
26	Electric Motors	Siemens/ Kirloskar/ ABB/ Crompton Greaves/Havells
27	ACB	L&T-U power(Omega)/ Siemens-3WL/ ABB- TMA/ Schneider-(NSX)/ Legrand-DPX/ GE-Entelliguard
28	MCCB	L&T-(D shine/DL)/ Siemens-VA/ ABB-TMA/ Schneider-(NSX)/ Legrand-DPX/ GE-Entelliguard
29	MCB/ RCCB	L&T/ Siemens/ Legrand-DX3/ ABB-TMA/ Schneider-Acti 9/ GE/ Hager/ Philips/ Havels/ ABB-SB
30	Power/ Auxiliary Contactors/ Timers/ Relay/ Starters	L&T/ Legnard / Siemens/ ABB/ Schneider
31	Change over switch/ Isolators	Schneider/ Siemens/ ABB/ GE/ L&T/ Socomec
32	Instruments (Digital/Analog)	L&T/ GE/ Siemens/ ABB/ Schneider/ Rishab/ AE/ Conzerve/ Minilec
33	Push Button/Indicating Lamps	L&T (Esbee)/ Siemens/ Schneider/ Rishab/ Veshno/ Raas
34	Selector Switches	L&T- Salzer/KAYCEE/ Siemens/ C&S
35	Cast Resin Current Transformers	AE/ L&T/ Kappa/ Rishab/ C&S
36	HT/LT- XLPE Cables	CCI/ Universal- Unistar/ Finolex/ Rallison/ Polycab/Havells/ RR Kable/KEI
37	Control Cables	CCI/ Universal- Unistar/ Finolex/ Rallison/ Polycab/Havells/ RR Kable/KEI
38	PVC Tape	Steelgrip/ 3M/ Burger
39	Cable Trays/ Raceways	OBO/ Legnard/ cooper/BEC/MEM
40	Compression Glands & Cable Lugs	Comet/ Dowells/ Jainson/ HMI/ Gripwell
41	Factory fabricated duct	Ductofab/ Rolastar/ Technofab / ZECO/Waves/Betaflo
42	G.I. Sheet	TATA/ SAIL/ Jindal/ JSW
43	Grilles/Diffusers/Volume Control damper	Systemair/ Caryaire/ Mapro/ Titus/Dynacraft
44	Fire Dampers	Caryaire/Systemair/ Ruskin/Airflow
45	Aluminium Sheets	Balco/ Nalco/ Hindalco/Jindal
	<b>Pipes</b>	
46	G.I & MS pipes factory rolled	Jindal Hissar/ Tata/ SAIL/MSL
	<b>Valves</b>	
47	Butterfly /Ball valve with Y strainer/Gate/Globe valve	Audco/ L&T/ Honeywell/Advance/Danfoss/Zoloto/Sant /Rapid Control/ Leader/ Emerald/ L&T/ VTM
48	Motorised butterfly valve(actuator)	Belimo/ Honeywell/ Siemens/danfoss
49	Non Return Valve	Advance/ Kirloskar/ Audco//L&T/Honeywell
50	Balancing Valves	Advance/ Audco/ Danfoss/ Honeywell/L&T
51	Pressure independent Balancing valve	Danfoss/ Flowcon/ TA/Honeywell/Siemens/Belimo
52	Pot-strainer & Y-strainer	Emerald/ Sant/ Rapid cool/VTM
53	Pressure Gauge	Fiebig/ Emerald/ Japsin/H Guru
54	Thermometer	Fiebig/ Emerald/ Japsin/H Guru

**LIST OF APPROVED MAKES : HVAC Works for NCA (Geriatric Block), New Delhi**

<b>S.No</b>	<b>Materials</b>	<b>PROPOSED MAKE</b>
55	Flow Switch	Rapid Control/ Anergy/Emrald
56	Automatic Air Vent	Rapid Control/ Anergy/Emrald
57	Suction Guide	Anergy/ Rapid Control/ Emrald
58	Filters (pre,fine Hepa)	Thermadyne/ Spectrum/ Kirloskar /Anfilco/ Johnflower/ Dynafilter/AAF/Camfil
59	Expanded Polystyrene	Beardsell Ltd./ BASF / Lloyd/ Styrene packaging/Thermobreak
60	Glass Wool/Fibreglass rigid board/Pipe	FGP Ltd./UP Twiga/ Kimmco/Owens corning
61	Pre-moulded PUF section for pipe & pipe supports	Malanpur /Superurethane/Lloyd/Supreme/Styrene Packaging
62	Crossed linked Polyethylene Foam	Trocellene / Supreme/Aeroflex/Vidoflex
63	Closed Cell Elastomeric Insulation	K-flex / Armacell/ Aeroflex/Supreme/Superlon
64	Mineral wool	Rockwool India Pvt Ltd/ Lloyd
65	Aluminium Tape	Johnson/ Birla 3M/ Garware
66	Expansion tank(pressurized) and Air Separator	Anergy/ Grundfoss/ ITT /Emrald/Reflex/Flamco
67	Bellows	Dunlop/ Kanwal/ Resistoflex
68	2/3-Way motorized valve for AHU/FCU	Johnson control/ Danfoss/ Siemens/ Belimo
69	Thermostats	Honeywell/ Johnson controls/ Belimo/ Danfoss/ Siemens
70	Humidistat	Honeywell/ Johnson control/ Belimo/ Danfoss /Siemens
71	Electric Strip Heaters	Escorts/ Daspass
72	Safety Thermostat for Heaters	Honeywell/ Siemens/ Danfoss/ Belimo /Siemens
73	Cooling/heating Mode Changer	Honeywell/ Siemens/ Danfoss/ Belimo/ Siemens
	<b>Paints</b>	
74	Enamel	ICI/ Asian/ Nerolac/ Berger
75	Bituminus	Indian Oil / HP/shalimar
76	Tarfelt ( for underground chilled water pipe insulation)	Indian Oil / HP/Shalimar
77	IBMS Approved vendor	Siemens/ Honeywell/ Johnson controls/ ABB/Schneider
78	DDC Controllers	Siemens/ Honeywell/ Johnson controls/ ABB/Schneider
79	Sensors(Pressure/Temperature)	Siemens/ Honeywell/ Johnson controls/ ABB/Schneider
80	VAV	Trane/ Trox/ Johnson Controls/ Belimo / Titus/Carryaire
81	Airflow Switch (Air & water)	Johnson control/ Honeywell/ Siemens
	<b>Miscellaneous</b>	
82	V Belt	Dunlop/ Fenner/Pix
83	Anchor fastners	Fischer/ Hilti
84	Dash fastner	Fischer/ Hilti
85	Welding rods	Advani/ L&T
86	Flexible pipe connection	Dunlop/ Kanwal/ Resistoflex
87	Hessian Cloth (fire rated)	Navair/ Pyrogaurd
88	Vibration isolator	Resist flex/ Dunlup/ Kanwal
89	Air Ozone	Ruks/ Trimed/ RGF
90	Fire Sealant	Birla 3M/ Hilti/ Promat
91	Adhesive / UV coating	Pidilite / Star bond
92	PVC /uPVC pipe	Polypack/ Supreme/Finolex/Truflo-Hindware
93	Refrigerant Copper Pipes	Mandev Tubes/Rajco Metal/Mehta Tubes (Max Flow)/ Kquality Tubes (Raj State)
94	Vacuum Degasser	Anergy/ Grundfoss/ ITT /Emrald/Reflex/Flamco