

TURNKEY



Mission Statement

TURNKEY Technologies Limited (hereinafter called “**TURNKEY**”) works as a multi-sector professional services provider with assets of knowledge, experience and solutions. We are committed to integrating green and sustainability principles into all aspects of our projects.

TURNKEY aims to achieve the satisfaction of client requirements in the execution of each service provided and aims to instill a culture of continual improvement and turnkey solutions to benefit our clients.



Who We Are

TURNKEY is a professional Data Centre E&M Infrastructure Services Provider based in Hong Kong, and is able to offer the optimum turnkey solutions on all challenging projects.

Our diverse skills and services have been applied to both standard and tailored products. We can ensure the quality, value, innovation, management and excellence of service to all our clients from institutes, SMEs, multi-national corporations and public listed corporations in Hong Kong and Macau. We can provide a range of services from System Integrators all the way to major IT infrastructure service projects.

Professional
On-Site support
1x24
Data centre
Cabling
Server Room
System Integrator
Cost-effective
Helpful
Customer-oriented
commitment
services

Who We Are

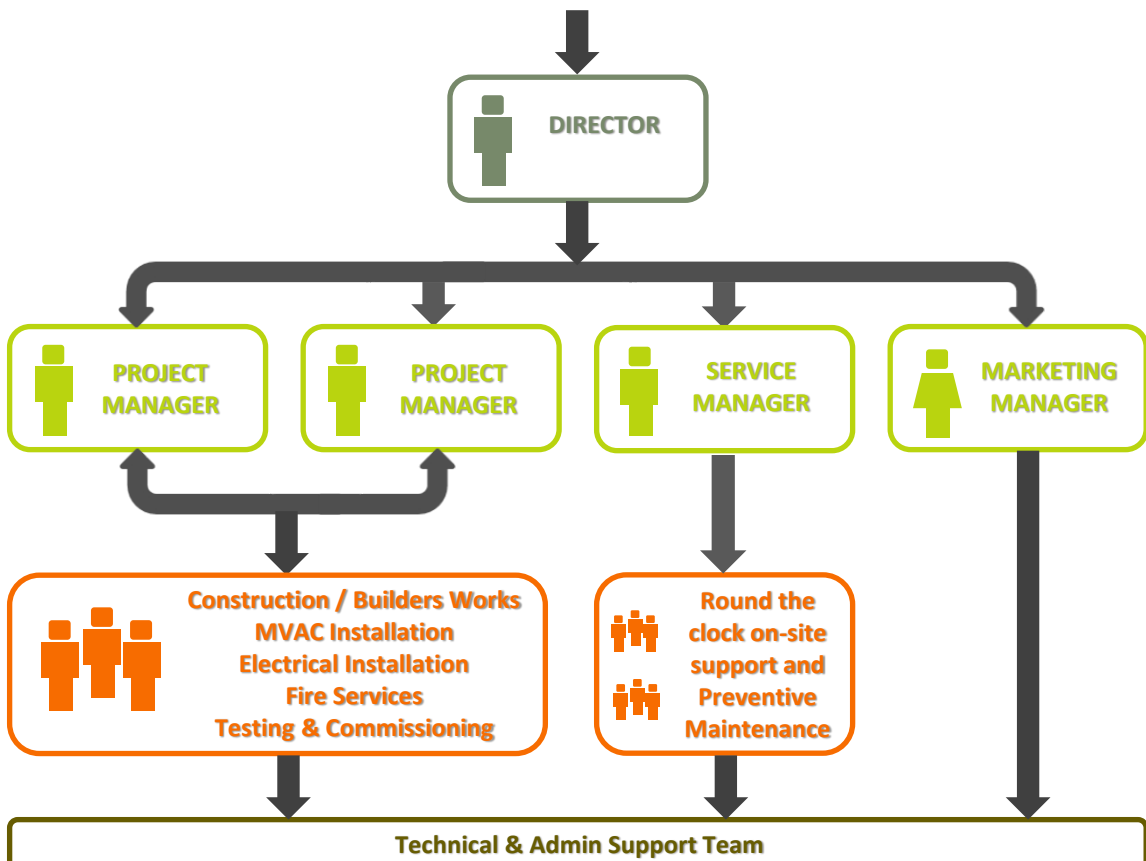
Our Team

TURNKEY's Specialist Team is experienced and accustomed to servicing our client's high standards. The team members have many assets, including:

- Proven integrated E&M Infrastructure design and management expertise and experience, having successfully completed numerous projects of similar scale and complexity.
- Strength in providing creative and unique designs specializing in Data Centre projects.
- The ability to provide fully personalized service.
- Full authority and capability to make decisions to direct and drive the project.



OUR VALUED CLIENTS



What We Do

TURNKEY strives to provide comprehensive consultancy services and turnkey solutions for Mission Critical Facilities:



Our Differentiation

TURNKEY is able to provide excellent all round services to our clients. Below are selected areas of our differentiation:

TURNKEY's strength not only to have strong track record in the design and build projects, but also including

- 🔧 Availability of extensive specialist expertise and knowledge in-house.
- 🔧 Work collaboration with Architects, Authorized Person, Registered Structural Engineers and Designers.

TURNKEY offers an alternative, fresh and unique design approach including

- 🔧 Creative and specialized planning solutions that work.
- 🔧 Unique design options that excite and entertain your guests.
- 🔧 Individual design solutions that are specific to your project.

TURNKEY will reduce the project expenditure

- 🔧 Will cost evaluate all specified materials.
- 🔧 Will incorporate cost effective solutions wherever feasible.
- 🔧 Introduce flexible planning concepts to reduce costs.

TURNKEY provides a personal service

- 🔧 A dedicated "Project Manager" actively involved from commencement to completion
- 🔧 Will design and work for the client – not ourselves.
- 🔧 Team members "on call" during project.
- 🔧 A compact expert team with extensive resources.
- 🔧 Have gained extensive repeat clients.



Our Strength

TURNKEY acquires specialized equipment and strikes to provide comprehensive professional services to satisfy our Client's needs:

Dummy Load Test Services

🔧 To provide TPN 18kw rack mount type dummy loader for T&C services.

Thermal Scanning Services

🔧 To provide professional engineers, tools and FLUKE® thermal imaging services on all server room E&M facilities including a thermal imaging report and thermal images.

Professional Power Quality Measurement & Logging Services

🔧 To provide an advanced power analyzing service by using a Power Analyzer: FLUKE® 435-II Series, which is the ideal portable power quality instrument providing advanced power quality functionality and energy analysis capabilities.

Battery Bank Health Checking Services

🔧 To provide a Professional Battery Bank Analyzer: FLUKE® BT520 Series, which is an ideal test tool for maintenance, troubleshooting and performance testing of individual stationary batteries and battery banks used in critical battery back-up applications.

Cable Testing and Certification Services

🔧 To provide an accurate and error-free certification by using The FLUKE® - DSX 5000 Cable Analyzer to enables testing and certification of twisted pair cabling and fiber. Making jobs easier to manage, and getting to system acceptance faster.

EV Charger Testing Services

🔧 To perform different tests for EV charging facility, incorporate with multi-meter like Fluke 1664 FC Multifunction Tester.



Our Collaboration

TURNKEY – through collaboration with architect, interior design specialists, authorized person, RSE and manufacturers we aim to offer the optimum turnkey solutions on all challenging projects. Shown below are our collaborations:



How We Work With Our Client

With our blend of experience and expertise, **TURNKEY** adopts a holistic approach to project development, using our complete spectrum of skills that cover all stages of the development cycle – all the way from preparing the business case and advising on related issues to devising and implementing the solution as well as providing ongoing support.

Most importantly, we are strongly supported by our honorable and strong **Business Partners:**



Our Signature Clients (Hong Kong):



Our Signature Clients (Hong Kong):



HAESL



Hong Kong Air

Cargo



HONGKONG AIRLINES
香港航空



香港浸會大學

HONG KONG BAPTIST UNIVERSITY



香港賽馬會

The Hong Kong Jockey Club



香港印鈔有限公司

HONG KONG NOTE PRINTING LIMITED



香港天文台

HONG KONG OBSERVATORY



HONG KONG
SPORTS INSTITUTE
香港體育學院



HKexpress



香港都會大學
HONG KONG
METROPOLITAN
UNIVERSITY

HUDGROUP



HUTCHISON PORTS
HIT



HONG KONG
CENTRE FOR LOGISTICS ROBOTICS
香港物流機械人研究中心



THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY



HSBC



兴业银行
INDUSTRIAL BANK CO.,LTD.



怡和科技
Jardine OneSolution



KKR

Magic
MICROBIOTA
I-CENTER

平安银行
PINGAN BANK



瑪麗醫院

Queen Mary Hospital



經緯集團



Northern Trust



Our Signature Clients (Hong Kong):



Our Signature Clients (Macau Government Departments):



教育暨青年局
Direcção dos Serviços de
Educação e Juventude



澳門特別行政區政府
社會工作局
GOVERNO DA RAEM
INSTITUTO DE ACÇÃO SOCIAL



文化局
Instituto Cultural

何東圖書館
Biblioteca Sir Robert Ho Tung



澳門基金會
FUNDAÇÃO MACAU



澳門特別行政區政府衛生局

Serviços de Saúde do Governo da Região Administrativa Especial de Macau



旅遊危機處理辦公室
Gabinete de Gestão de Crises do Turismo
Tourism Crisis Management Office



澳門特別行政區政府
Governo da Região Administrativa Especial de Macau
文化產業基金
Fundo das Indústrias Culturais



澳門貿易投資促進局
Instituto de Promoção do Comércio e do Investimento de Macau
Macao Trade and Investment Promotion Institute



個人資料保護辦公室
Gabinete para a Protecção de Dados Pessoais
Office for Personal Data Protection



澳門特別行政區政府勞工事務局
Governo da Região Administrativa Especial de Macau
Direcção dos Serviços para os Assuntos Laborais



澳門特別行政區政府體育局
Instituto do Desporto do Governo da RAEM



中國—葡語國家經貿合作論壇（澳門）常設秘書處



澳門特別行政區政府
Governo da Região Administrativa Especial de Macau
建設發展辦公室
Gabinete para o Desenvolvimento de Infra-estruturas



民政總署
Instituto para os
Assuntos Cívicos
e Municipais



廉政公署
CCAC



警察總局
SERVIÇOS DE POLÍCIA UNITÁRIOS



澳門特別行政區政府
Governo da RAEM
身份證明局
Direcção dos Serviços de Identificação

Our Signature Clients (Macau):



澳門理工學院
Instituto Politécnico de Macau
Macao Polytechnic Institute



澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU



聖若瑟大學
UNIVERSIDADE
DE SÃO JOSÉ



科學技術發展基金
FIDCIT



澳門博彩控股有限公司
SJM HOLDINGS LIMITED



澳門彩票有限公司
macau-slot.com



金龍酒店
Hotel Golden Dragon



MELCO RESORTS
& ENTERTAINMENT



广发银行 | CGB

Our Products

VERTIV™ is a leading data centre infrastructure players in the industry to provide global manufacturing and mission critical facilities.

Vertiv's Liebert® ITA2™ UPS Systems:

The Liebert® ITA2™ is a fully-digital, highly reliable, double-conversion UPS solution that delivers clean and consistent power. This highly efficient solution is ideal for various deployments, whether it's IT racks, network closets, automation control systems, and precision instruments to small-sized control rooms among other edge applications.

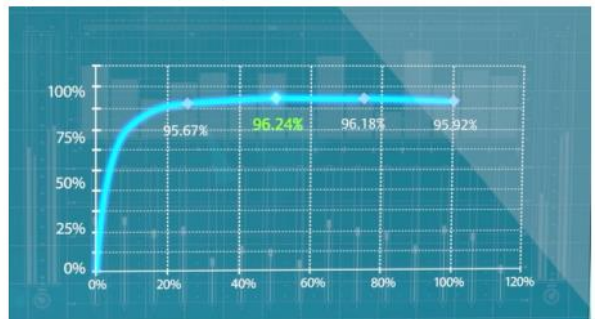
Key Features

- 🔧 Robust structure with cutting-edge channelized airflow design
- 🔧 Wide input voltage range, making it immune to grid interference
- 🔧 Programmable output outlets/terminals with cascade protection to protect key devices during heavy load
- 🔧 Integrated Ethernet port with HTTP protocol compatibility & streamlined remote monitoring
- 🔧 Easy to install, repair, and maintain
- 🔧 Compliance with seismic conduction & vehicle carrying test
- 🔧 Gravity sense LCD Display

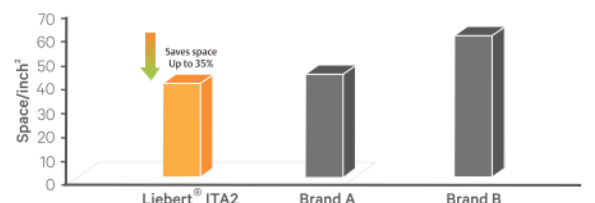


The Most Efficient UPS


Liebert® ITA2™ offers best-in-class efficiency of up to 96.3% over a wide range of load conditions, resulting in significant OPEX cost savings. ITA2™'s integrated Smart Sleep technology in ECO mode provides a superlative efficiency of up to 99%.



The Most Compact UPS









Our Products

 **VERTIV™** is a leading data centre infrastructure players in the industry to provide global manufacturing and mission critical facilities.

Vertiv's Liebert® CRV Row-Based Cooling Unit:

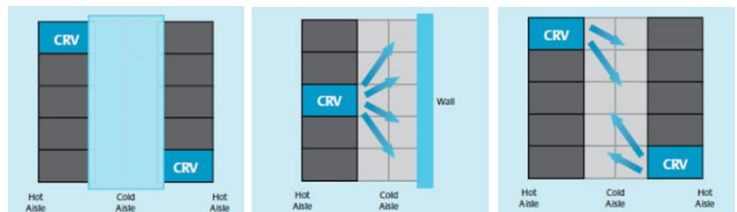
Key Features

-  Rack-sized Liebert CRV provides high capacity cooling in a small footprint
-  Available in 20 or 35 kW air cooled and water/glycol cooled systems, and 40 kW chilled water cooled systems
-  60 Hz models
-  Horizontal airflow, suitable for raised or non-raised floors
-  Features with the Liebert iCOM Control System to Monitor up to 10 racks with 20 sensors (precisely controls air temperature, humidity and filtration in the surrounding racks)
-  Adjustable airflow baffles on 24 in. (600mm)wide model maximize cooling to rack equipment, allowing the system to be positioned within the row or at the end of the row



600mm (24") cabinet:
20 or 35kW air or
water / glycol cooled;
40kW chilled water
cooled

300mm (12")
cabinet:
30kW chilled
water cooled



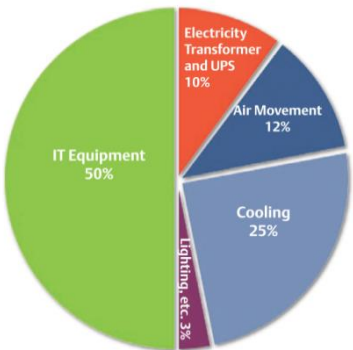
Our Products

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Vertiv PEX CRAC Systems:

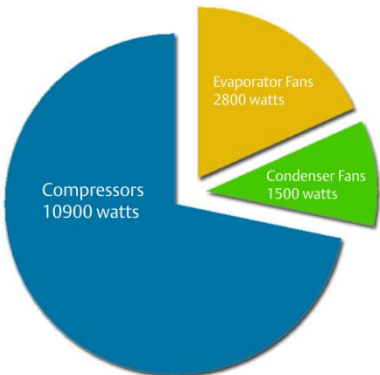
Key Performance Characteristics

Energy Efficiency



Energy Consumption in your Data Centre

Space Savings




Energy Savings Engineered Into Each Component

- Communications and Monitoring
- System Supervision and Management
- Multiple Configurations



Liebert PEX Dual Module
Downflow Unit

Our Products

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Vertiv APM150 Modular UPS Solution:

Key Performance Characteristics

- 🔧 Scalable, Flexible
- 🔧 Hot-plug modular design improves availability
- 🔧 Integral Intelligent power distribution and monitoring (Including Branch Circuit Monitoring)
- 🔧 96% high efficiency
- 🔧 The highest power density UPS
- 🔧 Easy Configurable, Dual-bus system
- 🔧 Unity Input and output Power factor UPS
- 🔧 Outstanding Input characteristics
- 🔧 Excellent Overload capacity
- 🔧 Advanced network management



Our Products

 **VERTIV™** is a leading data centre infrastructure players in the industry to provide global manufacturing and mission critical facilities.

Vertiv Static Transfer Switch (STS):

Key Features

- Short transfer interval (less than $\frac{1}{4}$ cycle) and high reliability achieved
- Manual and automatic transfer optional
- Priority of input source can be programmable
- Strong overload and anti-short-circuit capability
- User friendly design with large LCD display
- International Safety standard complied
- Rack-like black appearance, compatible with main-string server and network equipment
- Default equipment with input surge suppressor
- Various communication port available for remote control



Our Products

COWIN is one of the earliest manufacturers in China to engage in this DCIM service. It provides computer room monitoring solutions in various modes, such as embedded, local and remote monitoring, and networked monitoring management.

COWIN (DCIM Solutions) provides industry companies with critical facility monitoring software that is affordable and easy to use. This solution delivers superior monitoring, alerting, trending and data organization capabilities for companies in such verticals as healthcare, financial services, government and more, helping them protect and grow their business. Customers get monitoring, alerting and trending at a price that's right for their business.

Key Benefits:

- 🔧 Increase your business flexibility – Vendor neutral SNMP device management at no additional cost to run your business the way you need.
- 🔧 Gain an affordable solution – COWIN DCIM is a budget-friendly solution, making it easy for SMBs and enterprises to deploy systems.
- 🔧 Benefit from fast and easy configuration – Manage your own system configuration and changes, eliminating the need for support touchpoints (optional service packages are available).
- 🔧 Customize your data – Set your own views with our modern user interface to focus on the data you need most for your job.
- 🔧 Connect all operations – Use our API to connect to remote DCIM and building management systems (BMS) for a more complete picture of your operations.



COWIN DCIM Boards

Our Products



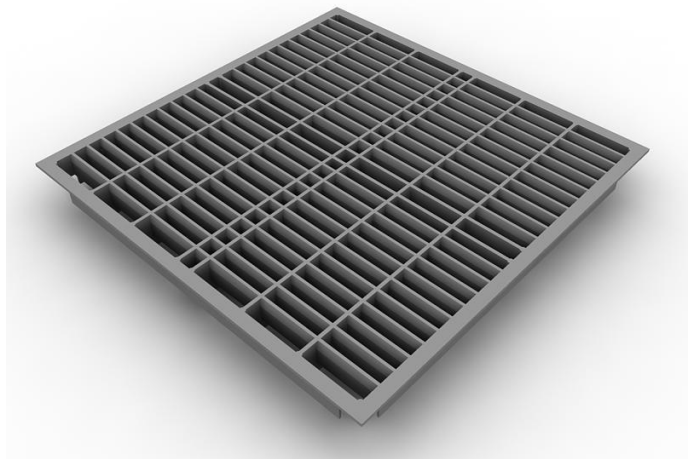
is the leading provider of airflow management solutions in America with over 40 years experience in the industry.

TURNKEY is proud to introduce the ***Airflow Management Systems.***

Data Clean® - Directional High Output Airflow Panel:

The DC-68-D is a 70 degree directional tile that will put the cold air directly into your server cabinet. A directional tile reduce air loss and the DC-68-D directional tile and it is a full 68% open area tile to maximize the amount of air to cool those high density servers.

The DC-68-D is also available with a sliding damper to adjust the volume of air required for your particular application and equipment load.



DC 68 Directional High Airflow Panel

Tile Specifications:

Dimensions: 600 x 600 x 55mm
Weight: 8.8 kg
Materials: Cast Aluminum
Open Area: 68%
Available with sliding damper

Our Products

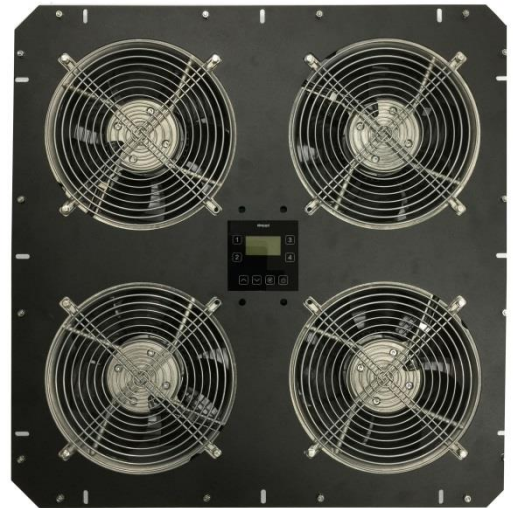


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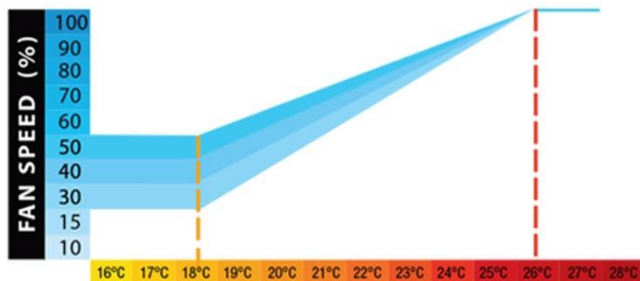
Data Clean® - Air Boost:

The New Airboost EC controller manufactured by EBM was designed specifically to control and monitor up to 4 EC-Fans and is equipped with 1.8" Mono LCD and Touch Sense Technology. Set minimum or idle fan speed from 15% to 100%, depending on desired airflow. They come with both manual control and remote temperature controlled features and can regulate the fan speed according to temperature signals received from up to 3 remote temperature sensors. The Airboost EC allows BMS connection to provide low and high temperature alarm information and have been used to cool upwards of 15kW server loads.



Air Boost Panel

Airboost EC Temperature Controlled:



The remote temperature control will automatically adjust the fan speed, based on temperature changes. The Airboost EC controller by EBM was designed specifically to control and monitor up to 4 EC-Fans and is equipped with 1.8" Mono LCD and Touch Sense Technology. Set minimum or idle fan speed from 15% to 100%, depending on desired airflow.

Temperature sensor behavior (shown below)

*Complete: 100% at 26C, 60% at 22C,
ON at 18C, OFF at 16C

**The graph shows the relationship of fan speed to temperature*

Our Products



is the leading provider of airflow management solutions in America with over 40 years experience in the industry.

TURNKEY is proud to introduce the ***Airflow Management Systems.***

Data Clean® - Sliding Door:

The ideal solution for both cold and hot aisle containment designs. Combining cost effectiveness with ease of installation, the no threshold design eliminates tripping hazards. Frame components arrive pre-assembled and easily connect to the header rail which secures the assembly together. Integrated slide-locks simplify door installation onto the frame.

The Sliding Doors reduces data center operating costs by improving thermal efficiency and reducing IT equipment intake temperatures, which enhances both equipment life and reliability.



DC Modular Aluminium Sliding Door

Our Products



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Round 4" Rack Mount Grommet

Designed to seal 4" (102 mm) cable openings in new and existing server rack cutouts to block bypass airflow and maximize cooling system efficiency within the rack.

- ✚ The Split feature of the HotLok Round Rack Mount Grommet allows product installation or removal without disturbing cables
- ✚ The Grommets contain no loose or partially fastened parts, which can become separated or fall into the rack
- ✚ The Grommets are impact resistant and durable
- ✚ HBT Membrane Layer ensures maximum air containment
- ✚ HotLok products are compliant with directive 2002/95/EC of the European Parliament and the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electric Equipment (RoHS)
- ✚ The Grommet features a membrane support structure



Round 4" Rack Mount Grommet



KoldLok Integral - Model #1010

Overall size: 11" x 8 1/4" x 1 5/8"
Grommet usable cable opening size: 8" x 4"
Grommet total cable opening size: 8" x 5"
Maximum Cutout Size (Interior Mount): 9 1/4" x 6 3/4"

Our Products



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TURNKEY is proud to introduce the ***Airflow Management Systems.***

HotLok™ Blanking Panel

Key Characteristics

- 🔧 Snap-spring design offers durable, 99.97+% effective seal
- 🔧 Tool-free, snap-in installation and easy-pull removal for any EIA-310-E standard openings using ergonomically designed finger grips
- 🔧 Cantilevered sealing vanes eliminate the gap between adjoining Blanking Panels or with installed equipment
- 🔧 1U Panels stack 10 high and 2U Panels stack 20 high for easy storage and ready availability
- 🔧 Upsite Temperature Strip colored-coded temperature ranges indicates potential hotspots by color based on ASHRAE Standard



Full Rack Modular Blanking Panels

- 🔧 Flexibility - Multiple U sizes (1U and 2U blanking panels; 3U, 9U and 12U blanking sheets)
- 🔧 Engineered mechanical clip design allows for a quick and simple installation
- 🔧 Can be re-used and re-configured as necessary
- 🔧 Utilizes ABS sheets that do not sag or require attachment to the rails (used for larger blanking areas)



HotLok Blanking Panels:

- 42U Kit (Included)
- 36U Kit (Excluded)

Our Products



serverLIFT® established in 2002, is the premier IT equipment handling solutions provider, with a strong focus on a safe and efficient way to handle servers and other IT equipment in the data center.

ServerLIFT® Heavy-Duty Electric SL-500Xi Server Lifter (500 lb. Capacity):

Unique Features

- 🔧 Built-in Easy Glide Shelf
 - Adds 6" of lateral movement into rack
 - Fits into standard 19" racks
 - Heavy-duty platform resists sagging and twisting with a 500lb. Load
- 🔧 Compact Design
 - Slim 24" wide base easily navigates narrow aisles
 - Fit through standard size doorways (under 6 feet tall)
 - Ideal for cold aisle containment
- 🔧 Smart Controls
 - Precise height adjustment with proprietary micro-processor controlled lifting system
 - Dual side controls allow a single operation to align equipment while facing the rack



Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA is a manufacturer specialized in early warning leak detection system for both Conductive Liquids and Non-Conductive Hydrocarbon Liquids, focusing on research and innovation with advanced features including: **Fail-Safe Loop Back, Anti-False Alarm and Monitor Leakage Level Remotely**

Features:

The Flagship Digi-Flex :

🔧 The Digi-Flex series upgrades from the [standard series](#), offering fully **customisable** capabilities that build efficient, real-time-monitoring liquid leak detection systems. This series also includes [oil-specific](#) products like **reusable** hydrocarbon sensing cables; zero-false-alarm, ultra-sensitive mini sensor modules; and thin-film (~0.1mm) oil-on-water detection modules etc. All systems boast a **Fail-Safe Loop-Back** feature, allowing continued detection even in the event of any cable break. But that's hardly all.



**ELSA Digi-Flex
3L-DF/TP 12' Touch Screen Panel**



**ELSA Digi-Flex Control Panel
3L-DF/SP**



**ELSA Digi-Flex Control Panel
3L-DF/SDP**



**ELSA Digi-Flex Sensor Module
3L-DF/SM50**

Our Products



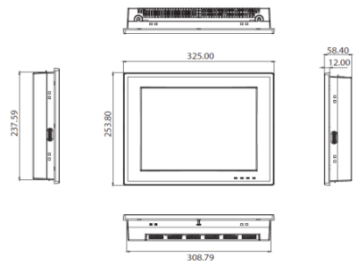
Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex 3L-DF/TP 12' Touch Screen Panel

The digital touch screen panel comes with a propriety software with features like SMS notifications, history log up to 5000 events, and precise leak showcase via floor map.



ELSA Digi-Flex
3L-DF/TP 12' Touch Screen Panel **Dimension:** 325mm(L)*253.8mm(H)*58.4mm(D)



Features:

- 🔧 Pin-Point Leak Location Precisely, tolerance +/-1m. (indication by RED DOT). ?
- 🔧 History/Event Log : 5,000 events based on FIFO basis. ?
- 🔧 “Freezing” of selected zone(s) during maintenance/repair and no fault message generated. ?
- 🔧 Readily connect to Mobile network / dialer for SMS fault notification (Optional) ?
- 🔧 Modbus/TCP (Optional). ?
- 🔧 Ability to Zoom-In onto each floor plan map. ?
- 🔧 Max. 50 Zones monitoring and display function. ?
- 🔧 Monitor up to 10 units of 3L-DF/SDP. ?
- 🔧 Systems able to monitor up to an accumulated Sensing Cable length of 5,000m (500m x 10 units) for LLDS OR up to 1,500m (150m x 10 units) for HLLDS application.
- 🔧 True Digital Leak sensitivity setting (threshold level 1 to 9) - applicable to LLDS only. eg: Level 1 ~ 3cm ; Level 9 ~ 50cm of liquid detected. ?
- 🔧 Modbus information is capable to show leak sensitivity level, thus the user will know the amount of water presence at the point of detection. ?
- 🔧 Redundancy : Fail-Safe Loop Back or Token Ring connection capability. (continues to detect leaks even cable break at 1st meter of sensing cable)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex Control Panel 3L-DF/SP

- 🔧 The 3L-DF/SP is able to support up to 40 sensor modules, 2000 metres of sensing cables, and a 1-9 detection sensitivity setting.



ELSA Digi-Flex Supervising Panel: 3L-DF/SP & Digi-Flex Sensor Module: 3L-DF/SM50-LD

Features:

- 🔧 3L-DF/SP is a Supervising panel to monitor and directly power each 3L-DF/SM50-LD sensor modules linked (up to 40 units).
- 🔧 Each 3L-DF/SM50-LD is an independent sensor module (no length association) and connected with cut-to-length liquid leak detection sensing cable (3L-LS, 3L-AS and/or 3L-AD).
- 🔧 Reliable frequency modulation is used for the digital communication between the panel and the modules.
- 🔧 Precision to locate leak location : +/-1m or 0.5%
- 🔧 Redundancy: Fail-Safe Loop Back or Token Ring connection feature built-in. (continues to detect leaks even cable break at 1st meter of sensing cable).
- 🔧 LCD Display: Backlight with LCD of 4 lines x 20 English characters
- 🔧 Sound Alarm: 90dB max. buzzer with silencing button
- 🔧 System Menu: Access to Event Log, System Reset, Configuration Mode
- 🔧 Multiple leak alarms simultaneously: Yes
(No. of simultaneously leak = No. of 3L-DF/SM50-LD sensor modules in use).
- 🔧 Max accumulated length of sensing cable up to 2,000m.
- 🔧 3L-DF/SP Box dimensions: Rugged ABS UL-VO case of L222 x W146 x H55mm.
- 🔧 3L-DF/SM50-LD Box dimensions: Rugged UV stable Polyamide encapsulated case with UL-94-V-0 approved.
- 🔧 Zone names setup: By PC-software (input each zone name up to 35 characters).
- 🔧 Event Log: 896 Time-stamped Events stored in non-volatile memory, First-In-First-Out (in case overflow)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex Control Panel 3L-DF/SDP

- The 3L-DF/SDP is a leak locating panel that can support up to 10 sensor modules, with an accumulated sensing cable length of 500 metres, complete with common and visual LED alarm.



ELSA Digi-Flex Control Panel: 3L-DF/SDP & Digi-Flex Sensor Module: 3L-DF/SM50-LD

General Features:

- Maximum length of sensor circuit (including jumper cable and diversions): 4000m
- Maximum length of sensing cable per sensor module: 50m
- Number of sensor module on same circuit: 40
- Precision to locate leak location: +/- 1m or +/- 0.5%
- Maximum voltage on circuit wires: 15VDC
- Input voltage: 100-240VAC or 12-24VAC/VDC (Optional)
- Power consumption: 4.5VA or 4W
- Alarm dry contact/relay: Operation – SPDT, Switch current – 0.5A at 250VAC, 1A at 30VDC
- Serial communication interface (Modbus Protocol): RS485-two-wire, ESD & surge protected as per IEC 6100-4-5
- Compatible sensing cables: 3L-LS, 3L-AS, 3L-AD
- Compatible supervising panels: 3L-DF/SP
- Touchscreen interface (Human Machine Interface - HMI): Optional - multi-zone touchscreen of 3L-TP/12 connectable via RS485 to 3L-DF/SDP
- Size of 3L-DF/SDP: 4 modules MS36 DIN-Rail (Dim: L=86 x W=70 x H=58mm) (Optional: IP65 Wall Mount Box)
- Size of 3L-DF/SM50-LD: Rugged UV stable Polyamide encapsulated case with UL-94-V-0 approved (Dim: L=75 x W=16 x H=15. comparable to the size of a “AA” battery)
- Operating ambient temperature: 0° to 40°C (indoor installation only)
- Storage temperature: -20° to 70°C
- Humidity: 5% to 95% non-condensing
- EMC emission: IEC61000-6-3(2001)-Electromagnetic compatibility. Generic emission standard for residential, commercial & light industrial environment
- EMC immunity: IEC61000-6-1(2001)-Electromagnetic compatibility. Generic immunity standard for residential, commercial & light industrial environment.

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex Sensor Module 3L-DF/SM50

The 3L-DF/SM50 is a sensor module used in conjunction with above Digi-Flex control panels, and allocated sensing cables (up to 50 metres per module).



ELSA Digi-Flex Supervising Panel: 3L-DF/SP & Digi-Flex Sensor Module: 3L-DF/SM50

General Features:

- † 3L-DF/SP is a Supervising panel to monitor and directly power each 3L-DF/SM50 sensor modules linked (up to 40 units).
- † Each 3L-DF/SM50 is an independent sensor module (no length association) and connected with cut-to-length liquid leak detection sensing cable (3L-LS, 3L-AS and/or 3L-AD).
- † Reliable frequency modulation is used for the digital communication between the panel and the modules.
- † Precision to locate leak location : $\pm 1\text{m}$ or 0.5% [?]
- † Redundancy : Fail-Safe Loop Back or Token Ring connection feature built-in. (continues to detect leaks even cable break at 1st meter of sensing cable).
- † LCD Display: Backlight with LCD of 4 lines x 20 English characters
- † Sound Alarm: 90dB max. buzzer with silencing button
- † System Menu: Access to Event Log, System Reset, Configuration Mode
- † Multiple leak alarms simultaneously: Yes (No. of simultaneously leak = No. of 3L-DF/SM50 sensor modules in use).
- † Max accumulated length of sensing cable up to 2,000m
- † 3L-DF/SP Box dimensions: Rugged ABS UL-VO case of L222 x W146 x H55mm.
- † 3L-DF/SM50 Box dimensions: Moulded in ABS case of L50 x W38 x H25mm. IP67 rated. [?]
- † Zone names setup: By PC-software (input each zone name up to 35 characters). [?]
- † Event Log: 896 Time-stamped Events stored in non-volatile memory, First-In-First-Out (in case overflow)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex Mini Sensor Module 3L-DF/SM50-LD

The 3L-DF/SM50-LD is a mini sensor module designed for conductive liquids. Capable of sensing up to 50 metres of cable, it also comes with a visual alarm via LED indicator.



**ELSA Digi-Flex Supervising Panel: 3L-DF/SP &
Digi-Flex Sensor Module: 3L-DF/SM50-LD**

General Features:

- 🔧 3L-DF/SP is a Supervising panel to monitor and directly power each 3L-DF/SM50-LD sensor modules linked (up to 40 units).
- 🔧 Each 3L-DF/SM50-LD is an independent sensor module (no length association) and connected with cut-to-length liquid leak detection sensing cable (3L-LS, 3L-AS and/or 3L-AD).
- 🔧 Reliable frequency modulation is used for the digital communication between the panel and the modules.
- 🔧 Precision to locate leak location: +/-1m or 0.5%
- 🔧 Redundancy: Fail-Safe Loop Back or Token Ring connection feature built-in. (continues to detect leaks even cable break at 1st meter of sensing cable).
- 🔧 LCD Display: Backlight with LCD of 4 lines x 20 English characters
- 🔧 Sound Alarm: 90dB max. buzzer with silencing button
- 🔧 System Menu: Access to Event Log, System Reset, Configuration Mode
- 🔧 Multiple leak alarms simultaneously: Yes (No. of simultaneously leak = No. of 3L-DF/SM50-LD sensor modules in use).
- 🔧 Max accumulated length of sensing cable: up to 2,000m :
- 🔧 3L-DF/SP Box dimensions: Rugged ABS UL-VO case of L222 x W146 x H55mm.
- 🔧 3L-DF/SM50-LD Box dimensions: Rugged UV stable Polyamide encapsulated case with UL-94-V-0 approved. Dim: L75 x W16 x H15mm. (comparable to the size of a "AA" battery)
- 🔧 Zone names setup: By PC-software (input each zone name up to 35 characters).
- 🔧 Event Log: 896 Time-stamped Events stored in non-volatile memory, First-In-First-Out (in case overflow)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA Digi-Flex Mini Sensor Module 3L-DF/SM50-HC

The 3L-DF/SM50-HC is a hydrocarbon (oil) sensor module connected to our cut-to-length hydrocarbon sensing cable.



**ELSA Digi-Flex Supervising Panel: 3L-DF/SP &
Digi-Flex Sensor Module: 3L-DF/SM50-HC**

General Features:

- ✚ 3L-DF/SP is a Supervising panel to monitor and directly power each 3L-DF/SM50-HC sensor module linked. (up to 40 Sensor Modules in series connection).
- ✚ Each 3L-DF/SM50-HC is an independent sensor module (no length association) and connected with cut-to-length hydrocarbons sensing cable (3L-HCS). (Note: Maximum length of 3L-HCS cable for each sensor module = 15m).
- ✚ Reliable frequency modulation is used for the digital communication between the panel and the modules.
- ✚ Precision to locate leak location: By each sensing cable length identification. ⓘ
- ✚ Redundancy: Fail-Safe Loop Back or Token Ring connection feature built-in. (continues to detect leaks even cable break at 1st meter of sensing cable).
- ✚ LCD Display: Backlight with LCD of 4 lines x 20 English characters.
- ✚ Sound Alarm: 90dB max. buzzer with silencing button.
- ✚ System Menu: Access to Event Log, System Reset, Configuration Mode.
- ✚ Multiple leak alarms simultaneously: Yes (No. of simultaneously leak = No. of 3L-DF/SM50-HC sensor modules in use).
- ✚ Max accumulated length of sensing cable: up to 600m
- ✚ 3L-DF/SP Box dimensions: Rugged ABS UL-VO case. Dim: L222 x W146 x H55mm.
- ✚ 3L-DF/SM50-HC Box dimensions: Rugged UV stable Polyamide encapsulated case with UL-94-V-0 approved Dim: L75 x W16 x H15mm. (comparable to the size of a "AA" battery) ⓘ
- ✚ Zone names setup: By PC-software (input each zone name up to 35 characters). ⓘ
- ✚ Event Log: 896 Time-stamped Events stored in non-volatile memory, First-In-First-Out (in case overflow)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA 3L-HCS Hydrocarbon Sensing Cable

- The 3L-HCS is a reusable hydrocarbon sensing cable used to quickly detect non-conductive liquids such as diesel and other fuels. See catalogue for full range of features and specifications.



ELSA Hydrocarbon Sensing Cable: 3L-HCS

Characteristics & Performance:

- Sensing technology:** Based on semiconductive elastomeric material swelling property when in contact with non-conductive liquids of hydrocarbon (such as Diesel, Fuel, Crude Oil & etc).
- No false alarm:** It is non-sensitive to water, dirt, pressure, vibration & etc.
- Install environment:** Suitable for industrial, outdoor or challenging environmental conditions. HCS cable is UV Resistance. Male/Female (M12) connectors are IP67 rated.
- High reliability:** Upon detection of hydrocarbon liquids, it remain reusable after simple cleaning. It will reset automatically after the evaporation of volatile liquids such as gasoline or light naphtha.
- Safe design:** Maximum voltage on sensing cable is limited to very low value which is at safe operation mode. Thus no risk of ignition when detected hydrocarbon liquids and is fully mitigated. Hazardous site is safe to operate with Zener Barrier connection as an option.
- Typical response time (Tested with 2m HCS cable):**
 - Gasoline, Light Naphtha : about 4 min.
 - Diesel, Oil, Jet Fuel : about 10 min.
 - Crude Oil : 30 to 60 min (depend on oil viscosity).
- Ambient temperature:** -40°C to +85°C.
- Minimum bending radius:** 80 mm.
- Typical diameter:** 10 mm.
- Cable length:** Standard length of 2m, 5m, 10m & 15m with connector. (Custom length available upon request)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA 3L-LS Sensing Cable

- 🔧 The 3L-LS is a distance-type sensing cable used to detect water, slightly corrosive and conductive liquids.



ELSA Sensing Cable: 3L-LS

Characteristics & Performance:

- 🔧 Application: Water and slightly corrosive conductive liquids
- 🔧 Diameter size: 6.3mm average
- 🔧 Continuity wires: Spirally-winded White & Red insulated with flame-retardant polymer
- 🔧 Central core: Insulated AWG18 stranded copper wire for greater pulling resistance
- 🔧 Sensing wires: Spirally-winded 2 x Black wires, semi-conductive polymer
- 🔧 Carrier: Flame-retardant polymer material with greenish colour in high visibility
- 🔧 Fire resistance: Non-flame propagating and self-extinguishing

3L-LS Sensing Cable Length:

- 🔧 Available in standard length of 1m, 3m, 7m and 15m (cut-to length is available upon request) 3L-LS SENSING CABLE CONNECTIONS/JOINTS:

3L-LS Sensing Cable Length:

- 🔧 M12 (14.5mm diameter) Male/female connector (i.e. all connections/joints is modular)
- 🔧 Hot-Shrink-Tube approach is available upon request or as per requirement (i.e. all connections/joints is fix)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA 3L-AS Sensing Cable

- The 3L-AS is a distance type sensing cable used to detect highly corrosive and conductive liquids i.e. 100% sulphuric acid.



ELSA Sensing Cable: 3L-AS

Characteristics & Performance:

- Application: Highly corrosive conductive liquids such as 100% Sulphuric acid
- Diameter size: 6.3mm average
- Continuity wires: Spirally-winded Yellow & Red insulated with fire-resistant fluoropolymer
- Central core: Insulated AWG18 stranded copper wire for greater pulling resistance
- Sensing wires: Spirally-winded 2 x Black wires, semi-conductive fire-resistant fluoropolymer
- Carrier: Fire-resistant fluoropolymer material with yellowish brown colour in high visibility
- Fire resistance: UL910 (NFPA 262), highest Fire/Smoke standard

3L-AS Sensing Cable Length:

- Available in standard length of 1m, 3m, 7m and 15m (cut-to length is available upon request)

3L-AS Sensing Cable Connections/Joints:

- M12 (14.5mm diameter) Male/female connector (i.e. all connections/joints is modular)
- Hot-Shrink-Tube approach is available upon request or as per requirement (i.e. all connections/joints is fix)

Our Products



Early Leak System Apparatus is to protect key installations and assets from intrinsic or extrinsic damages caused by a liquid (oil included) leak.

ELSA 3L-AD Sensing Cable

- 🔧 The 3L-AD is an Anti-Droplet sensing cable used to detect water, slightly corrosive and conductive liquids.



ELSA Sensing Cable: 3L-AD

Characteristics & Performance:

- 🔧 Application: Anti-water droplets detection but require to detect larger amount of water or slightly corrosive liquids
- 🔧 Diameter size: 6.3mm average
- 🔧 Continuity wires: Spirally-winded White & Red insulated with flame-retardant polymer
- 🔧 Central core: Insulated AWG18 stranded copper wire for greater pulling resistance
- 🔧 Sensing wires: Spirally-winded 2 x Black wires, semi-conductive polymer
- 🔧 Carrier: Flame-retardant polymer material with greenish colour in high visibility
- 🔧 Fire resistance: Non-flame propagating and self-extinguishing

3L-AD Sensing Cable Length:

- 🔧 Available in standard length of 1m, 3m, 7m and 15m (cut-to length is available upon request)

3L-AD Sensing Cable Connections/Joints:

- 🔧 M12 (14.5mm diameter) Male/female connector (i.e. all connections/joints is modular)
- 🔧 Hot-Shrink-Tube approach is available upon request or as per requirement (i.e. all connections/joints is fix)

Our Products

SENSAPHONE® has designed and built its full line of innovative remote environmental monitoring systems and early detection products since 1985 in Aston, Pennsylvania that quickly and effectively provide alerts to problems at your facilities.

Sensaphone Stratus EMS Monitoring System:

Sensaphone's cloud-based Stratus EMS allows you to monitor data center facilities and environments with the same degree of certainty you've come to expect from Sensaphone. Users can check critical conditions of their climate and equipment-sensitive commodities at any time.

The Stratus EMS monitors, delivers alarms, and data logs 64 input/output points from Modbus inputs in addition to 12 universal digital or analog inputs. It supports Modbus RTU/485 and Modbus TCP which make it capable of reading data from many IDF, PDU, UPS and Building Automation Systems. It takes the burden out of managing your system by giving you access to your readings from anywhere using a simple, powerful web-based interface. If there's a disruption, you'll be the first to know. Alerts can be sent straight to your mobile device—keeping you updated and giving you peace-of-mind wherever you are so you can remain focused on business as usual.

The Stratus EMS is available with an optional rack-mounted LCD that displays data onsite.



Our Products

SENSAPHONE® has designed and built its full line of innovative remote environmental monitoring systems and early detection products since 1985 in Aston, Pennsylvania that quickly and effectively provide alerts to problems at your facilities.

Features:

- 🔧 A supervised internet connection assures the Stratus EMS is online and monitoring at all times
- 🔧 Store your sensor readings in “the cloud” to automatically protect against data loss and provide limitless information storage
- 🔧 Notifies an unlimited number of people by e-mail, text message or voice phone calls in the event of an alarm
- 🔧 Poll Modbus registers from other equipment via RS485 and TCP/IP
- 🔧 12 powered universal digital or analog inputs monitor temperature, humidity, water and more
- 🔧 Temperature sensing range of -109° to 168 °F | -85° to 76 °C
- 🔧 Manage multiple units, make programming changes and access status conditions using a simple, powerful web-based interface
- 🔧 Fits in a 1U rack space
- 🔧 Up to 30 hours of extended battery backup life
- 🔧 2 relay outputs for manual or automatic switching
- 🔧 API Data Interchange Formats: JSON, HTTPS, POST, REST web services, cURL
- 🔧 Ability to use Sensaphone WEB600 and WSG30 as expansion modules



Our Products



is a well-known German brand Beha and US-based Amprobe have proven track record, with a combined experience of over 100 years, providing the great quality testing tools for electricians.

EV-500 Series:

- 🔧 Test Adapter Kits for Electric Vehicle Charging Stations are designed to test function and safety of charging stations mode 3 for AC charging.
- 🔧 The Adapter Kit allows you to conduct tests in combination with appropriate test instruments like an installation tester (for example the Beha-Amprobe ProInstall Series) and/or Scope Meters (oscilloscope) (for example Fluke 120B Series Industrial ScopeMeter handheld oscilloscopes).
- 🔧 With the Adapter Kit, the charging stations can be tested in accordance with IEC/EN 61851-1 and IEC/HD 60364-7-722.
- 🔧 To perform different tests for EV charging facility, incorporate with multi-meter like Fluke 1664 FC Multifunction Tester.



EV-500 Series Test Adapter Kits

Feature & Functions:

- 🔧 **Suitable to vehicle charging stations with charging mode 3**
- 🔧 **EV-connectors for type 2 and type 1**
- 🔧 **PE Pre-Test:** With this safety feature the PE conductor will be tested for possible presence of dangerous voltage against earth.
- 🔧 **Proximity Pilot (PP) state "Cable Simulation":** With PP State rotary switch the adapter can simulate various current capabilities of charging cables.
- 🔧 **Control Pilot (CP) state "Vehicle Simulation":** With CP State rotary switch selector various charging states can be simulated



Fluke 1664 FC Multifunction Tester



EV Chargers

Our Products

TURNKEY's Containment System provides tailor made and special measurements in order to cope with the Client's data centre environment.

Containment Systems

Aisle containment solutions increase cooling and airflow efficiencies by isolating chilled intake air from hot exhaust air. This reduces operational costs associated with cooling and attributes to higher equipment densities. Containment solutions can be designed in both hot and cold aisle configurations.

Hot-aisle containment systems are designed to isolate the hot aisle with vertical panels that direct hot exhaust air into the hot air return.

Cold-aisle containment systems are designed to isolate cold air with top panels that cover the aisle.

Benefits

- 🚧 Eliminates hot and cold air mixing
- 🚧 Works in both a raised floor and slab environments
- 🚧 Increases cooling capacity
- 🚧 Less Investment & More Savings
- 🚧 Saves energy and improves data center cooling efficiency



Contact Us

We welcome your participation to help us grow. For any queries or suggestions on our Services and Products of **TURNKEY**, please contact us:

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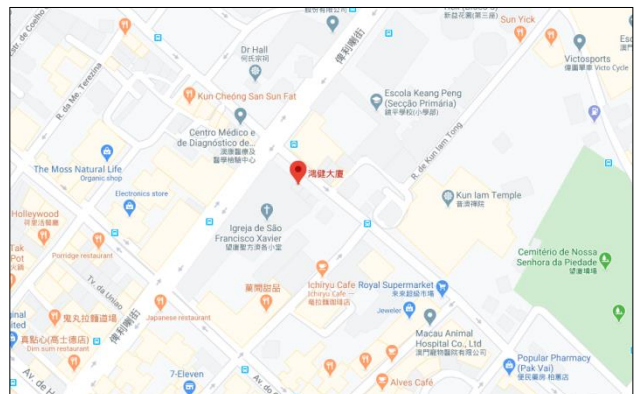
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