

INDUSTRIAL CUSTOMER SOLUTIONS AND BATTERY ACCESORIES CATALOG



⚡ CUSTOMER SATISFACTION

⚡ COMPETENT PERSONNEL

⚡ STRONG AND WIDESPREAD SERVICE NETWORK

⚡ QUICK SOLUTION

⚡ SOLUTION PARTNERSHIP



Industrial Customer Solutions

Industrial batteries are costly investments. The highest efficiency and long-term usage of them requires support from an expert team.

Use of the batteries by the trained personnel, regular maintenance of them by the experts, use of proper charging systems and correct accessories on basis of the conditions of use, extend the operational service life of the batteries.

Downtime costs are minimized. Operational and investment costs are reduced. Out of warranty expenses decrease.

Based on its more than 30 years of experience, inci GS Yuasa offers more reliable and efficient use of the batteries are achieved thanks to competent industrial customer solutions service, wide service network, wide range of spare parts supply, on-site and fast solution competence, easy accessibility, technological solutions, high technical equipment, service solutions specific to customer needs and training support.



Maintenance Packages

Our Target

- » Eliminating downtime caused by battery,
- » Extending service life of the batteries,
- » Reducing out of warranty costs.

Scope

- » All brands of industrial batteries,
- » New or used batteries for a certain period of time,
- » Operational conditions of the customer,
- » 0 year ≤ working period ≤ 6 years.

Operations

- » Exploration and reporting of the battery at the place of use,
- » Pricing
- » Preparing the maintenance schedule
- » Provision of the service by inci GS Yuasa



Annual maintenance schedule



Fast solutions by competent technical personnel support onsite




Efficient operation, minimum interruption, maximum benefit











Product specific, detailed, and effective maintenance

TRACTION BATTERY INSTRUCTION MANUAL

SAFETY MEASURES









-  » The battery emits hydrogen gas during recharging. Never approach the battery with flames or sources of ignition! Accident prevention regulations as well as EN 62485-3 and EN 50110-1 must be observed.
-  » Always use the required protective equipment (eye protector, mask, glove) during battery recharging or maintenance operations!
-  » The battery must not be tilted! Use only suitable handling equipment in accordance with VDI 3616.
-  » Waste batteries must be handed over to the authorized technical service in accordance with the regulations!
-  » Do not disassemble, heat above 60°C, or incinerate. Avoid any short circuit. Metallic parts under voltage on the battery, do not place tools or items on top of the battery.
-  » Pay attention to the instruction manual and fix them close to the battery. Work on batteries has to be carried out by skilled personnel only.
-  » When connecting and disconnecting the battery from the rectifier, the rectifier must be turned off.

OPERATING FEATURES

-  » After recharging, use the battery up to 80% max. and do not leave the battery at discharged status but recharged it. Stop using after receiving a signal from the vehicle.
-  » The electrolyte temperature must not exceed 40°C during recharging.
-  » Electrolyte density is 1,270 gr/cm³ at 25°C when the cell is fully charged.
-  » In terminal cable connection, do not allow excessive bending or deformation of cable and fix the cable to the battery tray.
-  » In the automatic filling system, pure water should be filled before recharging. The distance between the water tank used for filling pure water and the top point of the battery should be 2 m. The water pressure should be 0,2 - 0,25 Bar.
-  » The temperature of the environment where the batteries are kept must not exceed 25°C. Measure the total OCV and cell voltage once a month.
-  » The terminal connection screw should be tightened value of 32 Nm. For 2 PzS - PzB and 3 PzS - PzB products, the torque value should be 27 Nm.
-  » If SKP terminal shoe connection is used for connection of Battery terminals, the tightening crimping should be performed as required by the SKP shoe terminal manufacturer.

MAINTENANCE

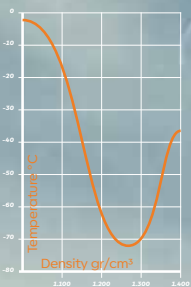
Definitely keep maintenance records for each battery!

-  **VISUAL CONTROL**
 - » Checks for any cracks, breaks on cells and terminals; and if any, call İnci GS Yuasa.
-  **STATUS OF POLES**
 - » If the connections are loose and/or non-isolated, deficiencies should be completed. If it is not proper, the melting of the cable and pole may occur.
-  **STATUS OF CONNECTIONS AND SOCKETS**
 - » Replace in case of cracks and/or deformation.
-  **STATUS OF PLUGS**
 - » Replace in case of cracks and/or deformation.
-  **ELECTROLYTE LEVEL CONTROL**
 - » The electrolyte level should never fall below the separator level or the minimum level specified in the filter plug (the bottom of plug). Electrolyte level is adjusted automatically in batteries that use automatic filling plug. (DIN 43530-4)
-  **AIR-MIX HOSE CANAL**
 - » If there is any blockage or breakage in the hoses, they should be cleaned or replaced.
-  **STATUS OF TRAY**
 - » If there is the accumulation of water or electrolyte, the discharge of accumulation must be with the pump from the tray. Otherwise, a breakdown could be seen.
-  **VOLTAGE - DENSITY CONTROL (After charging)**
 - » If the cell density is more than 1.310 gr/cm³, İnci GS Yuasa should be called.
 - » If the cell density is less than 1.260 gr/cm³, the equalizing charge should be done.

RECHARGING OPERATIONS

STATE OF CHARGE TABLE

State of charge	Cell voltage (Nominal)	Cell density (Nominal)
Fully charged	2,12 V	1,270 gr/cm ³
Discharged	1,70 V	



CELL FREEZING

- » If the cell is at a discharged state (1,100 gr/cm³), then the freezing starts at -7°C.
- » If the cell is at a fully charged state (1,280 gr/cm³), no cell freezing will be observed up to -71°C.
- » The frozen cell should be kept at room temperature and the rectifier charge should be performed after the electrolyte liquefies.

RECTIFIER CHARGE

- » Step 1: Rectifier Current = Battery Capacity x 15% (Cell voltage up to 2,40 V)
- » Step 2: Rectifier Current = Battery Capacity x 5% (Cell voltage up to 2,70 V)

RECTIFIER CHARGE TIME

- » Where the rectifier is compatible and battery has discharged up to 80%, rectifier charge time is 8-10 hours. Never open the plug lids during charging.
- » Batteries should be kept waiting for 2 hours after being charged.

WHEN TO PERFORM EQUALIZING CHARGE?

- » When more than 80% of Battery capacity is consumed,
- » When the battery is not used for 30 days,
- » After rectifier charge, if the density is <1.260 gr/cm³ at 27°C and the voltage difference between cells is more than 0,05V.

EQUALIZING CHARGE

- » Current = Battery Capacity x 5% (Cell voltage up to 2,70V-2,75V) When the rectifier is compatible with the battery, the average charging time is 20-24 hours.

ADDITION OF PURE WATER INTO CELL

- » The addition of pure water into the cell must be made before recharging. The electrolyte level should never fall below the separator level or the minimum level specified in the filter plug (the bottom of plug). When a filter plug is used, the need to top up water is indicated by the level falling below the minimum level mark.

Battery Monitoring System

Inci Battery Monitoring System is an electronic device reading and recording the battery performance indicators.

ONLINE MONITORING

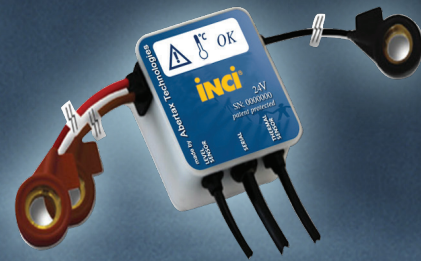


The current status and usage conditions of the battery can be seen instantly by bringing the battery to the charging room with a Wi-Fi receiver connected to the USB port or by automatically receiving and reporting data via the mobile modem device over the internet.

Advantages

- » It records the performance parameters indicators and operational data to enable the user to get maximum efficiency from the battery and to be controlled.
- » In case of warranty returns it assures to understand conditions in which the battery was subjected.
- » In the case of rental, it ensures to control battery usage by the customer.

OFFLINE MONITORING



Battery data is transferred to the computer via USB cable and transmitted as a report with specially prepared software.

Type of batteries

- » Traction batteries
- » Stationary batteries
- » VRLA (FT, AGM, and GEL) batteries

Measurements

- » Total voltage
- » Positive - negative half voltage
- » Temperature
- » Electrolyte level
- » (Operational) Battery charge and discharge current

Device Properties

- » Quick and easy mounting
- » Excellent battery installation by way of patented cables
- » Protection against reverse polarity
- » Acid Proof
- » The acid level sensor (for wet-type batteries)
- » Protection against electromagnetic effects
- » No impact from inductive current

Data cycles

- » Number and duration of charge - discharge
- » Battery and ambient temperatures
- » Duration of low electrolyte level
- » Deep discharge duration
- » Duration of exceeded half voltage difference limits
- » (Optional) Total current during charge and discharge time

Led Indicators

- » The equipment operates and there is no warning
- » Low electrolyte level for flooded batteries / Low voltage level for dry batteries
- » Battery temperature above 50°C

Benefits of Battery Monitoring System for the User

⚡ Longer battery life up to 20%

- » Intervention on time in case of misuse with the help of LED indicator.
- » By regular reporting improving the misuse conditions of the battery.

⚡ Less number of batteries for the fleet

- » Operation with a smaller number of batteries with efficient use.
- » Longer battery life.

⚡ Lower frequency for water filling

- » It prevents unnecessary control of the electrolyte level and filling thanks to the low electrolyte warning system on the LED screen.
- » Reduced labor costs by minimizing electrolyte level controls.

⚡ Reduced maintenance free



- » Reduced maintenance requirements of the batteries operated under proper conditions.

⚡ Under controlled warranty process





- » As all data are kept under record throughout the service life of the batteries, failure detection is carried out objectively in case of warranty returns.

List of Accessories and Spare Parts



Plug

Product	Description	Material
Plug with Filter (60Ah, 80Ah, 105Ah, 115Ah, 125Ah)	It helps to see electrolyte levels and prevents the fall of any undesired materials into the cell. Flip lid enables to check the electrolyte level without removing the plug.	
Plug with Filter (55 Ah, 65 Ah, 75 Ah, 85 Ah, 90Ah, 100 Ah, 140Ah, 155Ah)	It enables hydrogen and oxygen gases emitted during the charging process easily out of the cell.	
Aquamatic Filling Plug (60 Ah, 80 Ah, 105 Ah, 115 Ah, 125 Ah)	It enables the user to fill water automatically without any spillage. Automatic water filling keeps the intracellular electrolyte level constant, reducing maintenance and labor costs.	
Aquamatic Filling Plug (55 Ah, 65 Ah, 75 Ah, 85 Ah, 90 Ah, 100 Ah, 140 Ah, 155 Ah)	It stops the water filling system when the maximum electrolyte level is reached. It provides that the cell surface is clean and the tray's life is long.	



Coupling Components

Product	Description	Material
Main Connection Cable Cable Types: Flex and Perfect Cables Cable Section: 35 mm² - 120 mm²	Specially insulated Flex Cable for connection between the battery's negative, positive terminal and socket.	
	The specially insulated perfect cable for connection between the battery's negative/positive terminal and socket.	
Intercell Connection Cable Kablo Kesit Alani: 35 mm² - 120 mm²	Specially insulated flex and perfect type copper cable for connection between the cells.	
Plastic and Inox Coated Bolt M10x22 mm	Insulated and stainless bolt used on the standard (flex) cable with a bolt lock.	

Coupling Components

Product	Description	Material
Battery Connection Sockets (Wired or Wireless) Cable Section: 35 mm² - 50 mm² - 70 mm² - 95 mm² - 120 mm²	Socket for battery terminals provides the connection between rectifier and forklift.	
Cable Fixer	Special part for fixing the main connection cables to the tray.	

Filling Systems



Product	Description	Material
Aquamatic System Top Up)	<p>In the batteries with aquamatic system, all cell plugs are equipped with float and they are connected with hoses. The electrolyte of the cells is filled with an automatic system from a tank by hoses.</p> <p>Automatic filling reduces labor costs. It prevents acid spillage and assures a clean working environment. It saves time and water.</p>	
Aquamatic System Flow Indicator with Filter	The indicator that controls water flows in the aquamatic system. Its filter prevents all of any undesired materials into the cell.	

List of Accessories


Filling Systems

Product	Description	Material
Aquamatic System Coupling (Male)	Aquamatic system connection coupling at the end of the battery hose. It connects the hoses between the distilled water filling tank and battery.	
Aquamatic System Coupling (Female)	Aquamatic system connection coupling at the end of the filling tank. It connects the hoses between the distilled water filling tank and battery.	
Aquamatic System Filling "T" Connection 6x10x6 mm	Hose connection component for the aquamatic system.	
Aquamatic System Stopper	Aquamatic system component that terminates the hose.	
Aquamatic System Transparent Hose Outer Diameter: 14 mm Inner Diameter: 10 mm	The transparent hose provides water flow between the distilled water tank and battery.	
Aquamatic System Transparent Hose Outer Diameter: 9 mm Inner Diameter: 6 mm	The transparent hose provides water flow between the cells of the battery.	
Aquamatic System Distilled Water Tank 25lt.	It is used to fill up electrolytes for the maintenance of cells.	




Filling Systems

Product	Description	Material
Distilled water 1 Ton	It is used to fill up electrolyte for maintenance of cells.	
Distilled Water Preparation System and Compressed Storage Tank	It provides distilled water with required specifications that increase the service life of the battery. Around 150 liters of distilled water can be produced daily.	

Battery Monitoring System

Product	Description	Material
Smart Blinky Electrolyte Level Indicator	Illuminated indicator indicating about electrolyte level in the cell.	

Battery Maintenance System

Product	Description	Material
Manual Battery Transport Vehicle with Cylinder	Filling equipment which can be specially designed for all types and sizes of batteries.	
Acid Suction Pump	Electrolyte suction system that removes spilled electrolytes in the tray.	
Battery Loading – Unloading Equipment	It is a vacuum, electric equipment with pallet jack specially designed for the dimension of the battery. It is used to load and unload battery from the forklift and charging site. <i>Advantages: Safe replacement, ergonomic handling, quick replacement</i>	



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