



TL RANGE

**Telecom, Energy Storage,
Residential and other industrial
applications.**

AVAILABILITY

- ✔ Zero self-discharge when stored, at any state of charge
- ✔ Zero ageing in floating or storage condition
- ✔ Integrated system (BMS) for monitoring, diagnostics and data logging
- ✔ Module level redundancy
- ✔ Effective theft deterrent

ENVIRONMENT

- ✔ No active cooling required.
Constant performance and >20 years design life at:
-20°C to +60°C / -4°F to +140°F continuous operation
-40°C to +75°C / -40°F to +167°F peak
- ✔ Suitable for outdoor installation and marine environment
- ✔ Module ingress protection of IP55
- ✔ Free of toxic material and 96% recyclable

OPERATIONAL

- ✔ Up to 80% reduction in footprint and 3 times in weight than conventional batteries
- ✔ Status LED on front panel
- ✔ Low total cost of ownership (TCO)
- ✔ Scalable modules in parallel
- ✔ Expandable without limitation on battery age
- ✔ Parallel operation with other batteries
- ✔ Hot swappable
- ✔ Embedded DC breaker for low voltage disconnect (LVD) and short circuit protection
- ✔ Boost charging not required
- ✔ No memory effect
- ✔ Compatible with any standard DC power supply and rectifiers

SAFETY

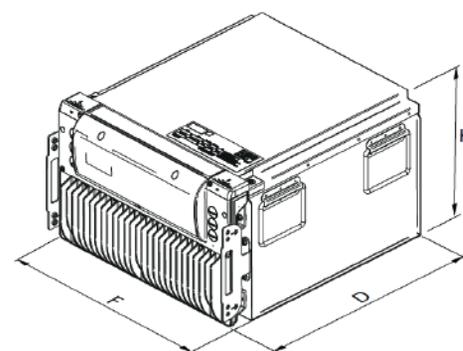
- ✔ No gassing or emission
- ✔ No risk of explosion even in presence of external fire
- ✔ Safest among existing batteries in all conditions: transport, storage and operation
- ✔ Embedded DC protection for load disconnection and short circuit protection
- ✔ Ready for remote monitoring
- ✔ Stainless steel case

DIMENSIONS AND WEIGHT

MODEL	FRONT	DEPTH	HEIGHT	WEIGHT
48TL120	498 mm / 19.6 in.	558 mm / 21.9 in.	320 mm / 12.6 in.	77 kg / 170 lb
48TL160	498 mm / 19.6 in.	558 mm / 21.9 in.	320 mm / 12.6 in.	91 kg / 201 lb
48TL200	498 mm / 19.6 in.	558 mm / 21.9 in.	320 mm / 12.6 in.	104 kg / 229 lb

GENERAL CHARACTERISTICS

OPERATING TEMPERATURE RANGE	-20°C / +60°C -4°F / +140°F continuous -40°C / +75°C -40°F / +167°F peak*
STORAGE DURATION	Indefinite (-40°/+60°C -40°F / +140°F)
DESIGN LIFE	>20 years
INGRESS PROTECTION	IP55
MAX CHARGING CURRENT	Self limited up to 0.2C
CYCLES	>4500 Cycles at 80% DoD



*Tested up to 16 hours continuously

SPECIFIC CHARACTERISTICS PER MODEL

MODEL	NOMINAL VOLTAGE (V)	CHARGE VOLTAGE RANGE (V)	NOMINAL CAPACITY at 4 hour rate		MINIMUM VOLTAGE (V)	MAX DISCHARGE CURRENT* (A)	MAX CHARGING CURRENT (A)	INTERFACE
			(Ah)	(Wh)				
48TL120	48	55-59	120	5700	40	90	24	RS485 / USB
48TL160	48	55-59	160	7700	40	120	32	RS485 / USB
48TL200	48	55-59	200	9600	40	150	40	RS485 / USB

*Higher peak can be tolerated for limited period of time

HORIEEN MANUFACTURING

- ✔ More than 1 GWh deployed in 50 countries
- ✔ Made in Switzerland
- ✔ ISO 9001 – Quality Management System
- ✔ ISO 14001 – Environmental Management System

APPLICABLE STANDARDS

- ✔ EN IEC 61000-6-2 / EN IEC 61000-6-4
- ✔ CE
- ✔ UL9540A (Safety)
- ✔ UL1973
- ✔ IEC62984 / IEC60529
- ✔ NEBS DA1976 Level 1 and Level 3
- ✔ EN IEC 62485-1 / EN IEC 62485-2
- ✔ Comply with DNV and ABS rules for offshore installations

HORIEEN reserves the right to change or revise without notice any information or detail given in this publication TLRANGE - 2024-05-21



RW RANGE

110RW80H - 110RW80HV
110RW80 - 48RW200

**Oil & Gas, Communications,
Rail and other industrial use.**

AVAILABILITY

- ✔ Zero self-discharge when stored, at any state of charge
- ✔ Zero ageing in floating or storage condition
- ✔ Integrated system (BMS) for monitoring, diagnostics and data logging
- ✔ Module level redundancy

ENVIRONMENT

- ✔ No active cooling required.
Constant performance and 20 years design life at:
-25°C to +65°C / -13°F to +150°F continuous operation
-40°C to +75°C / -40°F to +167°F peak
- ✔ Suitable for outdoor installation and marine environment
- ✔ Module ingress protection of IP65
- ✔ Free of toxic material and 100% recyclable

OPERATIONAL

- ✔ Up to 80% reduction in footprint and 3 times in weight than conventional batteries
- ✔ Low total cost of ownership (TCO)
- ✔ Scalable modules in parallel
- ✔ Expandable without limitation on battery age
- ✔ Parallel operation with other batteries
- ✔ Hot swappable
- ✔ Boost charging not required
- ✔ No memory effect
- ✔ Compatible with most industrial AC and DC UPS

SAFETY

- ✔ No gassing or emission
- ✔ No risk of explosion even in presence of external fire
- ✔ Safest among existing high energy density batteries in all conditions: transport, storage and operation
- ✔ Embedded DC protection for load disconnection and short circuit protection
- ✔ Ready for remote monitoring
- ✔ Double stainless steel case

GENERAL CHARACTERISTICS

FARADIC CHARGE EFFICIENCY	100%
CYCLES	4500 Cycles at 80% DoD
OPERATING TEMPERATURE RANGE	-25°C to +65°C / -13°F to +150°F
IP RATE	IP65

SPECIFIC CHARACTERISTICS PER MODEL

MODEL	NOMINAL VOLTAGE (V)	NOMINAL CAPACITY (Ah)	NOMINAL ENERGY (Wh)	VOLTAGE OPERATING RANGE (VDC)	BUS VOLTAGE RANGE (VDC)	MAX CONTINUOUS DISCHARGE CURRENT (Amps)	WARM-UP TIME TO BE OPERATIONAL (hours)	INTERFACE
110RW80	110	80	8500	88 to 140	120 to 140	125	<14	CAN-bus
110RW80H/HV*	110	80	8500	88 to 140	120 to 140	125	<14	CAN-bus
48RW200	48	200	8700	34 to 60	50 to 60	380	<14	CAN-bus

*110RW80H: side handles on external case
110RW80HV: hot swappable, side handles on external case

DIMENSIONS AND WEIGHT

MODEL	FRONT	DEPTH	HEIGHT	WEIGHT
110RW80	640 mm / 25.2 in.	507 mm / 20 in.	388 mm / 15.3 in.	107 kg / 236 lbs
110RW80H/HV*	586 mm / 23.1 in.	492 mm / 19.4 in.	342 mm / 13.5 in.	103 kg / 227 lbs
48RW200	640 mm / 25.2 in.	507 mm / 20 in.	392 mm / 15.4 in.	110 kg / 242 lbs

HORIEN MANUFACTURING

- More than 1 GWh deployed in 50 countries
- Made in Switzerland
- ISO 9001 - Quality Management System
- ISO 14001 - Environmental Management System

APPLICABLE STANDARDS

- EN 50155
- EN 50121-3-2
- EN 55011
- UL9540A (Safety)
- Designed to comply with UL1973



ST523

**Community, industrial and
Large-Scale energy storage
installations.**

AVAILABILITY

- ✔ Zero self-discharge when stored, at any state of charge
- ✔ Zero ageing in floating or storage condition
- ✔ Integrated system (BMS) for monitoring, diagnostics and data logging
- ✔ Module level redundancy

ENVIRONMENT

- ✔ No active cooling required.
Constant performance and >20 years design life at:
-20°C to +60°C / -4°F to +140°F continuous operation
- ✔ Suitable for indoor and outdoor installation (IP43)
- ✔ Free of toxic material and 96% recyclable

OPERATIONAL

- ✔ 100% maintenance free in operation
- ✔ Allows remote monitoring
- ✔ Up to 80% reduction in footprint and 3 times in weight than conventional batteries
- ✔ User interface on Web Server
- ✔ No memory effect
- ✔ Low total cost of ownership (TCO)
- ✔ Scalable modules in parallel
- ✔ Expandable without limitation on battery age
- ✔ Easy integration with Power Conversion Systems

SAFETY

- ✔ No gassing or emission
- ✔ No risk of explosion even in presence of external fire
- ✔ Safest among existing batteries in all conditions: transport, storage and operation
- ✔ Embedded DC protection for load disconnection and short circuit protection
- ✔ Redundant safety features (chemistry, cell, battery module and BMS)

GENERAL CHARACTERISTICS

NOMINAL VOLTAGE	620 VDC
OPERATING VOLTAGE RANGE	450 to 670 VDC
NOMINAL CAPACITY	38 Ah (100% DOD)
RATED ENERGY	22.5 kWh (100% DOD at C/10)
CYCLES	>4500 Cycles at 80% DoD
ROUND TRIP EFFICIENCY	90% Round Trip Efficiency (at 6.25 kW Discharge/Charge power; 80% DOD)

BMS CHARACTERISTICS

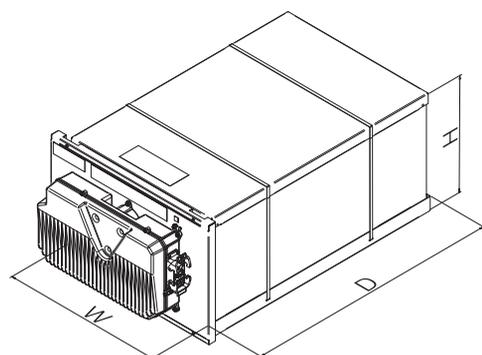
EXTERNAL POWER SUPPLY	24 VAC and 600 VDC
MONITOR/CONTROL	Internal contactors for automatic safe disconnection, both on Positive and Negative poles External contact available for remote battery disconnection
CHARGE CONTROL	Embedded electronic charge regulator (DC/DC converter)
ST523 GATEWAY	The battery system controller (Gateway) allows to manage one or more ST523 batteries connected in parallel. The battery system controller. The Gateway communicates through Modbus TCP/IP over Ethernet.

DIMENSIONS AND WEIGHT

WIDTH (W)	DEPTH (D)	HEIGHT (H)	WEIGHT
624 mm / 24.6 in	1023 mm / 40.2 in	406 mm / 16 in	256 kg / 564 lb

HORIEN MANUFACTURING

- ✔ More than 1 GWh deployed in 50 countries
- ✔ Made in Switzerland
- ✔ ISO 9001 – Quality Management System
- ✔ ISO 14001 – Environmental Management System



APPLICABLE STANDARDS

- ✔ EN IEC 62485-1:2018
- ✔ EN IEC 62485-2:2018
- ✔ BS EN IEC 61000-6-2:2019
- ✔ CE marking, in conformity with:
 - EU Directive 2001/95/EC General Product Safety
 - EU Directive 2014/30/EU Electromagnetic Compatibility
 - EU Directive 2014/35/EU Low Voltage Directive
- ✔ Comply with DNV rules for offshore installations
- ✔ Comply with RINA rules for ships classification (marine)



UP RANGE

Oil & Gas, Utilities, Rails,
Communications and other
industrial use.

AVAILABILITY

- ✔ Zero self-discharge when stored, at any state of charge
- ✔ Zero ageing in floating or storage condition
- ✔ Integrated system (BMS) for monitoring, diagnostics and data logging
- ✔ Module level redundancy

OPERATIONAL

- ✔ Up to 80% reduction in footprint and 3 times in weight than conventional batteries
- ✔ Status LED on front panel
- ✔ Low total cost of ownership (TCO)
- ✔ Scalable modules in parallel
- ✔ Expandable without limitation on battery age
- ✔ Parallel operation with other batteries
- ✔ Hot swappable
- ✔ Boost charging not required
- ✔ No memory effect
- ✔ Compatible with most industrial AC and DC UPS

HORIEN MANUFACTURING

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- ✔ ISO 9001 - Quality Management System
- ✔ ISO 14001 - Environmental Management System

ENVIRONMENT

- ✔ No active cooling required.
Constant performance and >20 years design life at:
-20°C to +60°C / -4°F to +140°F continuous operation
-40°C to +75°C / -40°F to +167°F peak
- ✔ Suitable for outdoor installation and marine environment
- ✔ Module ingress protection of IP55 and up to IP65
- ✔ Free of toxic material and 96% recyclable

SAFETY

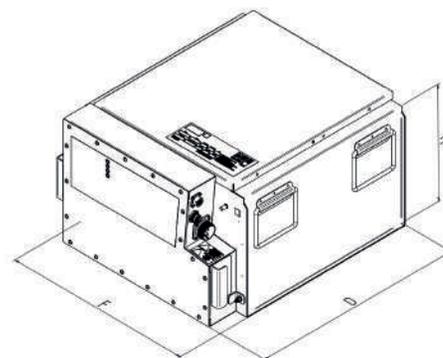
- ✔ No gassing or emission
- ✔ No risk of explosion even in presence of external fire
- ✔ Safest among existing batteries in all conditions: transport, storage and operation
- ✔ Embedded DC protection for load disconnection and short circuit protection
- ✔ Ready for remote monitoring
- ✔ Stainless steel case

APPLICABLE STANDARDS

- ✔ EN 61000-6-2 / EN 61000-6-4
- ✔ CE
- ✔ UL9540A (Safety)
- ✔ IEC62984 / IEC60529 / IEC61508
- ✔ Comply with DNV and ABS rules for offshore installations
- ✔ UL1973

GENERAL CHARACTERISTICS

OPERATING TEMPERATURE RANGE	-20°C / +60°C -4°F / +140°F continuous -40°C / +75°C -40°F / +167°F peak*
STORAGE DURATION	Indefinite (-40° / +60°C)
DESIGN LIFE	>20 years
INGRESS PROTECTION	IP55 (IP65 as optional)
MAX CHARGING CURRENT	Self limited up to 0.2C
CYCLES	> 4500 Cycles at 80% DoD



DIMENSIONS AND WEIGHT

MODEL	FRONT (mm / in.)	DEPTH (mm / in.)	HEIGHT (mm / in.)	WEIGHT (kg / lb)
24UP120	498 / 19.6	341 / 13.4	322 / 12.7	45 / 99
24UP160	498 / 19.6	374 / 14.7	322 / 12.7	55 / 121
24UP200	498 / 19.6	374 / 14.7	322 / 12.7	61 / 134
48TL200	498 / 19.6	558 / 21.9	320 / 12.6	104 / 229
110UP80	495 / 19.4	520 / 20.4	322 / 12.7	94 / 207
125UP80	495 / 19.4	557 / 21.90	322 / 12.7	104 / 229
220UP40	495 / 19.4	520 / 20.4	322 / 12.7	94 / 207
250UP40	495 / 19.4	557 / 21.9	322 / 12.7	103 / 227

SPECIFIC CHARACTERISTICS PER MODEL

MODEL	NOMINAL VOLTAGE (V)	CHARGE VOLTAGE RANGE (V)	NOMINAL CAPACITY at 4 hour rate		MINIMUM VOLTAGE (V)	MAX CONTINUOUS DISCHARGE CURRENT (A)	MAX CHARGING CURRENT (A)	INTERFACE
			(Ah)	(Wh)				
24UP120	24	27-30	120	2880	18	90	24	RS485 / USB
24UP160	24	27-30	160	3840	18	120	32	RS485 / USB
24UP200	24	27-30	200	4800	18	150	40	RS485 / USB
48TL200	48	54-59	200	9600	40	150	40	RS485 / USB
110UP80	110	121-160	80	8450	79	120	16	RS485 / Canbus / USB
125UP80	125	135-160	80	9600	90	120	16	RS485 / Canbus / USB
220UP40	220	242-300	40	8640	162	60	8	RS485 / Canbus / USB
250UP40	250	270-300	40	9600	180	60	8	RS485 / Canbus / USB



Z RANGE

Commercial Vehicles, Bus
and Off-Highway

SMC TECHNOLOGY

- ✔ Use of sodium and nickel as active materials, with solid ceramic electrolyte
- ✔ Cells with hermetically sealed steel case, packed in double-thick mica to insulate each cell and prevent electrical shorting
- ✔ Internal operating temperature around 270°C / 518°F, with external surface temperature only few degrees above ambient
- ✔ Made with 2.58 Volt cells with 140 Wh/kg or 310Wh/lb and 280 Wh/liter specific density
- ✔ Proven technology for energy storage and clean powering of electric vehicles

KEY BENEFITS

- ✔ More than 10 years of field experience
- ✔ Made in Switzerland
- ✔ 300.000.000 km
- ✔ Temperature immunity
constant performance from -40°C to +50°C
- ✔ No outgassing and zero ambient emissions
- ✔ No hazardous components
- ✔ 100% recyclable
- ✔ High level industrialization production
- ✔ Manufacturing capacity for high volumes

BATTERY TECHNICAL FEATURES

- ✔ Highest specific energy
- ✔ High level of safety
- ✔ Integrated battery BMS
- ✔ Integrated thermal management
- ✔ Double stainless steel battery case
- ✔ Opportunity charge supported
- ✔ No memory effect

APPLICATION

- ✔ Commercial vehicles
- ✔ Bus
- ✔ Off-Highway - Mining

CERTIFICATIONS

- ✔ ISO 9001
- ✔ E24 / R10 homologation
- ✔ CE mark
- ✔ ISO 14001

Z60 CHARACTERISTICS

CAPACITY	38 Ah
RATED ENERGY	24.7 kWh
OPEN CIRCUIT VOLTAGE 0 - 15% DOD	650 V
MAX. VOLTAGE (REGEN BRAKING)	730 V
MIN. VOLTAGE (30 SEC. PEAK POWER)	434 V
CELL TYPE / N° OF CELLS	ML3X / 252
WEIGHT WITH BMI	216 kg
SPECIFIC ENERGY WITH BMI	114 Wh/kg
ENERGY DENSITY WITHOUT BMI	184 Wh/l
AMBIENT TEMPERATURE	-40 to + 50 °C
THERMAL LOSS AT 270°C (INTERNAL TEMP)	< 130 W
COOLING	air
HEATING TIME	24 h at 230 VAC
PERIPHERY	BMI, Fan

