



ELECTRIC LIFT TRUCK

Explosion-Proof Type



Explosion- Proof Forklift Trucks

Pioneer

History

Nichiyu developed Japan's first explosion-proof electric forklift in 1965.

In 1965, Nichiyu utilized its experience in the manufacture of explosion-proof electric locomotives for mines to develop Japan's first explosion-proof reach forklift truck.

While demonstrating the same class of functions as Nichiyu's standard reach forklift trucks, this explosion-proof electric forklift featured an electrical system incorporating parts that met the explosion test requirements of the Industrial Safety Institute of the Ministry of Labor in effect at that time. This innovation enhanced the safety of material handling operations at sites in which forklift trucks handled explosive gases and flammable liquids.

The introduction of explosion-proof forklift trucks contributed significantly to the rationalization of material handling operations at sites where forklifts could not previously be used to handle propane and other explosive gases.



Our logistics expertise in hazardous locations continues to earn the confidence of our customers.

After more than 45 years of offering industry-leading technology, setting sales records, and introducing a variety of models adapted to various environments, we are proud of having earned the trust of companies in a wide range of industries that handle explosive gases and flammable liquids.

As a pioneer in explosion-proof forklift trucks with outstanding safety performance grounded in our wide-ranging logistics know-how for hazardous environments, we deliver peace of mind to customers who operate forklifts in such locations.

What is a hazardous site?

Hazardous sites are those where a risk of explosion or fire ignition exists due to the presence of explosive gas in the air. Such sites where gas vapor can occur are considered hazardous sites.

Hazardous sites exist in a variety of industries.

Hazardous sites are comprehensively evaluated according to the type and volume of hazardous materials handled, the area of the site in which these materials are handled, and the ventilation conditions.

The accompanying list indicates industries that typically contain sites judged as hazardous because they handle explosive and flammable gases.

- Ammonium sulphate manufacturing
- Soda industry
- Electric furnace industry
- Compressed & liquid gas manufacturing
- Coal tar product manufacturing
- Dye & intermediate product manufacturing
- Fermentation/Ethylene methanol derivatives manufacturing
- Synthetic resins & plastics manufacturing
- Chemical fiber manufacturing
- Vegetable fat & oil manufacturing
- Manufacturing of fatty acids, hardened oils, & glycerin/Dry distillation of wood
- Pharmaceutical manufacturing
- Paint manufacturing
- Insecticide & pesticide manufacturing
- Perfume & cosmetics manufacturing
- Photographic materials manufacturing/Oil refining
- Rubber product manufacturing
- Brewery industry
- Processed paper & fabric manufacturing
- Dry cleaning industry
- Coating industry
- Printing industry/Other industries



Compliance with Japan's Explosion-Proof Inspection Standard

All the Nichiyu explosion-proof forklift trucks comply with the de2G4 grade of the explosion-proof standard of the Japanese Labor Safety and Health Law, and can be used in Zone 2 hazardous area.



d Flame-proof type construction

(Applicable to motors, control units and switch boxes)
This indicates fully enclosed construction. The enclosure can withstand the force of a gas vapor explosion occurring within it. It also prevents any sparks from contacting an external explosive gas.

e Increased Safety type construction

(Applicable to battery and horn)
This type of construction features increased insulation and security in order to protect against the dangers of increased temperature and damage from an external force.

2 Explosion class

Explosion classes are ranked as class 1, 2 and 3 in order of increasing risk of gas explosion. The larger the number, the greater the risk of an explosion.

G4 Ignition group

Explosive gases are classified into five categories according to ignitability. The higher the category number, the lower the ignition temperature and the greater the risk of explosion.

Classification of Explosive Substances by Ignition Group and Explosion Class

Explosion class	Ignition group	G1	G2	G3	G4	G5
1		Acetone Ammonia Carbon monoxide Ethane Acetic acid Ethylacetate	Toluene Propane Benzene Methanol Methane	Ethanol Amylacetate-iso 1-Butanol Butane Acetic anhydride	Gasoline hexane	Acetaldehyde Ethyl ether
2		Coal gas	Ethylene Ethylene oxide			
3		Water gas Hydrogen	Acetylene			Carbon disulfide

Classification of hazardous area

Zone 0 1) A location where risk remains that explosion or fire may occur, and explosive gases are not lower than the lower explosion limit continuously or sustained for a long time.

Zone 1 1) A location where explosive gases build-up to reach hazardous concentrations under normal use conditions.
2) Due to repair, maintenance, or leakage, explosive gases often build-up to reach hazardous concentrations.

Zone 2 1) A location where flammable gases or flammable liquids handled under tightly sealed conditions may leak to reach hazardous concentrations only in the case of accidents or malfunction.
2) A location where explosive gases may buildup to reach hazardous concentrations in the case of failure of a ventilation system.
3) A location such as the surrounding area of a Zone 1 location or an adjacent room inside where explosive gases at a hazardous concentration rarely invade.

Highly Reliable Construction for Assured Safety

Safe and secure explosion-proof construction that incorporates all of Nichiyu's proprietary technology

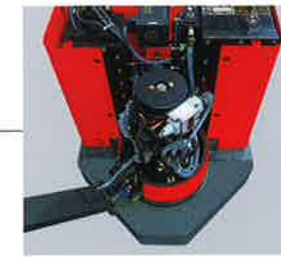
All electronic equipment on these forklift trucks, such as control system and motors, is installed in completely airtight enclosures designed to withstand the force of an explosion. The free application of Nichiyu's proprietary and pioneering mechatronics technology ensures excellent safety while maintaining powerful and speedy functionality.



Controller



Controller



Traction motor



Traction/hydraulic motor

Enhancing safety with a battery compartment offering an improved explosion-proof structure

The battery is now installed in an explosion-proof structure for increased safety against risks such as increased temperature and damage due to external forces. The new compartment also offers enhanced isolation functions. In addition, the structure naturally discharges hydrogen gas in order to prevent dangerous accumulations of residual gas.



Dissipation of static electricity

Nichiyu forklifts are provided with conductive tires in order to prevent the build-up of static electricity within the forklift. This feature helps to reduce the risk of explosion.



Enhanced work efficiency through operator-focused design

All these trucks ensure safe, speedy and efficient operation thanks to a functional, ergonomic layout enhanced with our new control system.



Match your forklift needs with one of our wide model variations

FB series

Counterbalanced Truck

Capacity: 1500-3000kg

It has been updated, now equipped with AC motors and controllers for both of traction and hydraulics. It adds to an exceptional combination of overwhelming speed, eye-opening power and unmatched maneuverability and operability. The wide model variation of 1500, 1750, 2000, 2500 and 3000 kg enables customers in hazardous locations to select suitable equipment to meet their materials handling needs - indoor or outdoor.



Models	FB-E70 Series						
	FB15P	FB18P	FB20P	FB25P	FB30P		
Rated Capacity	kg	1500	1750	2000	2500	3000	
Load Center	mm	500					
Lifting Height	mm	3000					
Free Lift	mm	115					
Lift Speed	Laden	mm/s	320	310	270	230	
	Unladen	mm/s	540				
Travel Speed	Laden	Pneumatic km/h	14.0	13.5	13.0	12.0	
	Unladen	No Puncture km/h	13.0	12.5	12.0	11.0	
Travel Speed	Laden	Pneumatic km/h	16.0	15.5	15.0	14.0	
	Unladen	No Puncture km/h	15.0	14.5	14.0	13.0	
Min. Turning Radius	mm	1845	1890	2080	2130	2385	
Dimensions	Overall Length	mm	3100	3155	3335	3395	3645
	Overall Width	mm	1090				
	Overall Height (Mast lowered)	mm	1975				
	Fork Length	mm	1070				
	Fork Spread (Min.-Max)	mm	240-920				
	Wheelbase	mm	1250				
Front Overhang	mm	420					
Service Weight*	kg	2310	2450	3100	3320	3735	
Tyres	Front	Pneumatic	21x8-9-14PR		23x9-10-16PR		
		No Puncture	21x8-9		23x9-10		
Tyres	Rear	Pneumatic	5.00-8-8PR		18x7-8-14PR		
		No Puncture	5.00-8		18x7-8		
Control System		Inverter					
Motor**	Travel [55%]	kW	6.8		8.0 [35%]		
	Hydraulic [25%]	kW	7.5		9.8		
	Power Steering [35%]	kW	0.45		0.9		
Battery	Voltage	V	48				
	Capacity	STD Ah/5HR	400		450		
		OPT Ah/5HR	485, 545		565, 600		
Charger	Automatic Stationary Charger (OPT)						
	Capacity	kVA	6.5		8.1		

*Without Battery

** [] : Operating Duty = $\frac{\text{Operating time of motor}}{\text{Time of one operating cycle}} \times 100(\%)$

FBR series

Reach Truck stand-on type

Capacity: 1000-3000kg

We offer 15 models in the industry's most varied product line. Equipped with the A-SICOS microcomputer controller, these units offer the top traveling performance among all manufacturers of material handling equipment. This truck offers outstanding ease of operation with electric power steering, expanded operator space, and excellent visibility.



Models	FBR-E70 Series																
	FBR 10H	FBR 13H	FBR 13H	FBR 14	FBR 14	FBR 15	FBR 15	FBR 18	FBR 18	FBR 20	FBR 20	FBR 25	FBR 25	FBR 30	FBR 30		
Rated Capacity	kg	1000	1250	1350	1500	1500	1800	2000	2500	3000							
Load Center	mm	500															
Lifting Height	mm	3000	3000	4000	3000	4000	3000	4000	3000	4000	3000	4000	3000	4000	4000		
Free Lift	mm	405															
Lift Speed	Laden	mm/s	320	300	300			280			260			210			
	Unladen	mm/s	490														
Travel Speed	Laden	km/h	9.5			9.5			9.0			10.0			9.5		
	Unladen	km/h	10.5														
Min. Turning Radius	mm	1315	1460	1510	1460	1555	1555	1735	1735	1785	1750	1940	1940	2000	2040		
Reach Stroke	mm	380	530	530	460	560	560	740			640	810	810	870	840		
Dimensions	Overall Length	mm	1950	1950	2000			2020			2095	2145	2210	2210	2280	2380	
	Overall Width	mm	1090														
	Overall Height (Mast lowered)	mm	1995														
	Height	Mast Extended	mm	3900	3900	4900	3900	4900	3900	4900	3900	4900	3950	4950	3950	4950	
	Fork Length	mm	850														
	Wheelbase	mm	1095	1245	1245	1245	1345	1345	1525	1525	1630	1700	1700	1770	1800	2000	
Front Overhang	mm	175															
Service Weight*	kg	2040	2160	2310	2210	2260	2250	2350	2310	2450	2970	3100	3060	3190	3340		
Tyres	Load (2pcs.)	mm	Rubber ø255x114			Urethane ø254x114			Urethane ø267x114			Urethane ø267x135					
	Drive (1pc.)	mm	Rubber ø330x145			Rubber ø330x145			Rubber ø330x165			Rubber ø380x165					
	Caster (2pcs.)	mm	Rubber ø178x73			Rubber ø178x73			Rubber ø204x76			Urethane ø204x76					
Control System		Chopper Control															
Motor**	Travel [35%]	kW	4.0			4.0			4.7			4.7					
	Hydraulic [25%]	kW	6.4			6.4			8.0			8.0					
	Power Steering [35%]	kW	0.39			0.39			0.39			0.39					
Battery	Voltage	V	48														
	Capacity	STD Ah/5HR	201			210			280			320			370		
		OPT Ah/5HR	240			280			320			370			-		
Charger	Automatic Stationary Charger (OPT)																
	Capacity	kVA	3.8			3.8			4.7			4.7			4.7		

*With Standard Battery

** [] : Operating Duty = $\frac{\text{Operating time of motor}}{\text{Time of one operating cycle}} \times 100(\%)$

PLD/KLD series

Walkie Low-lift Truck

Capacity: 1000-3000kg

The upper section of the steering handle incorporates operation switches for traveling, lifting and horn. Anyone can quickly and easily learn to operate this truck thanks to its compact design and small turning radius. It excels at reducing the labor of conveyance work in confined workspaces and in upper floor warehouses.



Photo: KLD

FBD series

Walkie High-lift Truck

Capacity: 500-1500kg

Despite its compact size, this truck easily accommodates heavy duty operating conditions. It is perfectly adapted to confined workspaces with limited floor strength.



LP/LS series

Low-lift Truck

Capacity: 2000kg

With its microcomputer controller, this truck exhibits excellent traveling performance. It handles horizontal conveyance operations at speed in large workspaces such as factories and warehouses.



Photo: LP

RB series

Order Picker

Capacity: 500-1500kg

The integrated right-hand side layout of the accelerator grip, levers and switches of this innovative truck ensures exceptional ease-of-use and highly natural approach to operator safety. It also handles the fine-picking operations required for multi-product, small-lot production.



Equipment and Accessories

To make works at hazardous locations safer and more comfortable— a wide range of Nichiyu original accessories realize improved safety and operability.

For example, FB, FBR, and LP/LS include electric power steering as standard equipment. All models have an electric horn as standard equipment.

TYPE	FB	FBR		PLD/KLD	FBD	LP/LS	RB
Capacity (t)	1.5~3.0	1.0~2.0	2.5~3.0	1.0~3.0	0.5~1.5	2.0	0.5~1.5
Equipment							
Electric power steering	○	○	○			○	●
Head lamp (2pcs.)	●	●	●			●	●
Back up lamp (1pc)	●	●	●				
Turn signal lamp	○	●	○			●	○
Electric horn	○	○	○	○	○	○	○
Back buzzer	●	●	●				●
Forward & Back buzzer	●	●	●				
Revolving light	●	●	●				
Hour meter	○	○	○				
Battery discharge indicator	○	○	○			○	○
Self diagnosis function	○	○	○				
Safety monitor	○	○	○				
I/O check	○	○	○				○
Lift limit switch	●	●	●				
Stop & Tail lamps	●						

○: Standard ●: Option

Maintenance

Proper maintenance is even more critical with explosion-proof forklifts than it is with regular forklifts. Nichiyu's skilled service staff provides the optimum maintenance services to help maintain the integrity of our explosion-proof products.



All specifications have been determined according to Nichiyu's terms and conditions. Specifications are subject to change without notice in the interests of product improvement.

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