

NSR12N2 NSR16N2 NSR20N2 NSR12N2I NSR16N2I NSR20N2I

**SPECIFICATIONS** 

STAND-IN STACKERS 24V, 1.2 - 2.0 TONNES

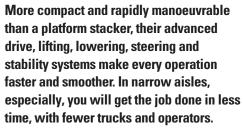


## **STEP IN AND SAVE**

THE SMARTER CHOICE. THESE WORLD-LEADING STAND-IN STACKERS WILL REDUCE YOUR TOTAL COST OF OPERATION (TCO). HOW? BY BOOSTING PRODUCTIVITY, LOWERING FLEET AND LABOUR COSTS, AND INCREASING STORAGE DENSITY. IDEAL FOR LONG AND SHORT INTERNAL TRANSPORT, ORDER PICKING AND STACKING UP TO 7 METRES.









Stand-in stackers enable you to use your valuable warehouse space more fully by making aisles narrower and racking higher. Fulfilling multiple roles, including order picking, they offer similar lifting capabilities to many reach trucks but at lower prices and in tighter spaces.



Contained and protected within the truck's robust structure, operators work quickly and confidently – with lower accident and damage risk – thanks to automated speed and stability aids. The operator compartment is vibration-free, comfortable, quiet and very easy to enter and exit.



Ergonomic controls give further comfort, job satisfaction and productivity – and avoid stress, strain and fatigue.

They include a fully adjustable (up/down, forward/back) steering console, allowing the perfect driver position, and armrestmounted features for simultaneous control of drive and hydraulic functions.

### **LOWER COST OF OPERATION**

- Robust construction and component sealing minimises damage and wear, even in demanding multi-shift operations.
- Multifunctional display option with onboard diagnostics encourages correct use of truck and speeds up maintenance.
- PIN code identification prevents unauthorised use, while choice of PRO, ECO and EASY modes matches truck performance to operator experience and application. (Only with multifunctional display option.)
- Easy, fail-safe battery lock avoids delays and accidents at exchanges.
- Fast maintenance access combines with low servicing requirements and long service intervals to reduce downtime.
- Availability of fully integrated Li-ion battery increases battery
  efficiency, runtime and lifespan, while minimising maintenance needs,
  for even lower total cost of operation (TCO).

### **UNMATCHED PRODUCTIVITY**

- Advanced AC motor and control technology enables fast, smooth and precise driving, lifting and lowering.
- Integrated functionality saves time by allowing simultaneous control of drive speed, mast/fork movements and side stabiliser deployment.
- Side stabilisers (optional) increase residual capacity for high lifting.
- Progressive electric power steering automatically adjusts sensitivity according to speed, for high precision in tight manoeuvres and high stability when travelling fast and straight.
- Automatic cornering control reduces maximum travel speed according to steering angle, to ensure quick but safe, stable and confident turns.
- Creep speed feature increases load capacity for lifts above 1.7 m by automatically limiting travel to 5 km/h when forks reach that height.
- Tapered forks and angled fork tips permit faster pallet entry with less risk of damage.
- With Li-ion battery, performance is enhanced and fast opportunity charging is possible, via easily accessible connector, for continuous operation without battery changes.
- High ground clearance avoids sticking on ramps and uneven floors.
- Initial lift (I) models give additional ground clearance and may be used for double pallet handling — with one load on the support legs and one on the forks. (Models NSR12N2I, NSR16N2I and NSR20N2I.)

- Level assistance system option provides a quick and simple way for operators to choose between stopping at each pre-set height or bypassing it.
- Laser fork height indicator option aids accuracy in placing forks at correct level.
- Ergo forks trailing control option allows speed adjustment from a more convenient position - as well as clearer vision - for operators standing in the direction of travel with forks trailing.
- 360-degree steering option enables fluid turning without stopping to change direction.

### SAFETY AND ERGONOMICS

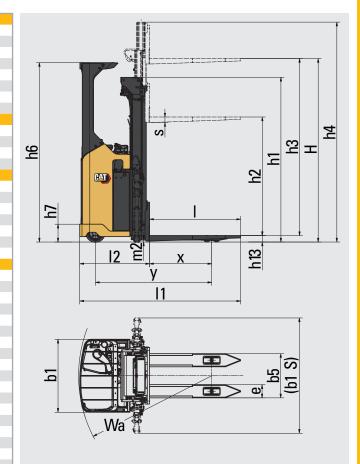
- Enclosed operator position ensures all-round protection by heavy-duty chassis, integrated bumper, overhead guard pillars and roof.
- Comfortable operator compartment minimises strain and tiredness with low step-in height, fully floating floor, outstanding levels of vibration damping, cushioned backrest, and plenty of space.
- Optical presence sensor reduces stress and fatigue by allowing operator to make small foot movements without accidentally activating automatic braking.
- Fully adjustable steering wheel allows different driving positions depending on travel direction.
- Adjustable armrest comfortably supports wrist while positioning hand ideally to operate the thumbwheel throttle, fingertip hydraulic levers and other controls simultaneously.
- Clear all-round and fork-tip view is achieved through careful design of mast, fork carriage, overhead guard, pillars and chassis, and by low-reflection surfaces.
- Low-noise specification includes quiet, temperature-controlled fans and speed-regulated lift pump motors, for a pleasant operator environment.
- Working aids include large tool storage compartment under armrest and accessible from outside truck – plus holders for smaller equipment, phone and drinks, and a writing desk with paper clamp.
- Intuitive multifunctional display option keeps drivers fully informed and is optimally positioned and angled for clear viewing.



# **STANDARD EQUIPMENT AND OPTIONS**

	NSR12N2	NSR12N2I	NSR16N2	NSR16N2I	NSR20N2	NSR20N2I
GENERAL						
Standard display incl. hour meter and battery indicator	•	•	•	•	•	•
Key switch entry	•	•	•	•	•	•
Electric power steering	•	•	•	•	•	•
Speed-regulated lift motor and proportional valve for lowering	•	•	•	•	•	•
Tandem load wheels Vulkollan	•	•	•	•	•	•
Overhead guard	•	•	•	•	•	•
Adjustable armrest	•	•	•	•	•	•
Adjustable steering wheel	•	•	•	•	•	•
Storage compartment under armrest	•	•	•	•		•
Writing desk with paper clip	•	•	•	•	•	•
Battery rollers	•	•	•	•	•	•
Initial lift	_	•	_	•	_	•
Chill store design, down to -10°C	•	•	•	•	•	•
POWER SOURCE						
Li-ion batteries	0	0	0	0	0	0
Lead-acid batteries	0	0	0	0	0	0
ENVIRONMENT						
Cold store design, 0°C to -30°C	0	0	0	0	0	0
DRIVE AND LIFT CONTROLS						
Height-adjustable steering wheel	•	•	•	•	•	•
Fingertip controls for lifting/lowering	•	•	•	•	•	•
WHEEL OPTIONS						
Vulkollan	•	•	•	•	•	•
Tractothan	0	0	0	0	0	0
Super grip	0	0	0	0	0	0
OTHER OPTIONS						
Side stabilisers	_	_	0	0	0	0
Ergo forks trailing control , EFTC	0	0	0	0	0	0
360-degree steering	0	0	0	0	0	0
Multifunctional display incl. BDI and hour meter, PIN code login (100 codes) and graphic icons	0	0	0	0	0	0
Foldable seat	0	0	0	0	0	0
Load backrest	0	0	0	0	0	0
Key switch entry (in combination with multifunctional display)	0	0	0	0	0	0
Laser positioning guide	_	_	0	0	0	0
Load weight indicator	0	0	0	0	0	0
Lift height indicator	_	_	0	0	0	0
Level assistance system LAS	_	_	0	0	0	0
Loading assistance	_	-	0	0	0	0
Panoramic ProVision roof	0	0	0	0	0	0
12V DC power socket	0	0	0	0	0	0
5V USB socket	0	0	0	0	0	0
Accessory rack	0	0	0	0	0	0
Writing desk incl. RAM C holder	0	0	0	0	0	0
Accessory rack holder RAM system size C	0	0	0	0	0	0
Accessory rack holder RAM system size C, 2 pcs	0	0	0	0	0	0
Accessory rack holder RAM size D	0	0	0	0	0	0
Working lights LED	0	0	0	0	0	0
Increased drive speed	0	0	0	0	0	0
Special RAL colour	0	0	0	0	0	0
- Popular - 11 - 2 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5						

	Characteristics					
1.1	Manufacturer			Cat Lift Trucks	Cat Lift Trucks	Cat Lift Trucks
1.2	Manufacturer's model designation			NSR12N2	NSR16N2	NSR20N2
1.3	Power source			Battery	Battery	Battery
1.4	Operator type			Stand-in	Stand-in	Stand-in
1.5	Load capacity	0	(kg)	1250	1600	2000
1.6	Load centre distance	С	(mm)	600	600	600
1.8	Load wheel axle to fork face (forks lowered)	х	(mm)	800	800	800
1.9	Wheelbase	У	(mm)	1422 1)	1496 <sup>1)</sup>	1545 <sup>1)</sup>
	Weight					
2.1a	Truck weight with load, with maximum battery weight		kg	2682	3356	4018
2.1b	Truck weight without load, with maximum battery weight		kg	1432	1756	2018
2.2	Axle loadings with nominal load & maximum battery weight, drive / load side		kg	1127/1555	1389/1967	1613/2405
2.3	Axle loadings without load & with maximum battery weight, drive / load side  Wheels, drive train		kg	1002/430	1229/527	1413/605
3.1	Tyres: PT = Power Thane, Vul = Vulkollan, P = Polyurethane, N = Nylon, R = Rubber drive / load side			Vul / Vul	Vul / Vul	Vul / Vul
3.2	Tyre dimensions, drive side		(mm)	250 x 105	250 x 105	250 x 105
3.3	Tyre dimensions, load side	Ø	(mm)	85 x 70	85 x 70	85 x 70
3.4	Castor wheel dimensions (diameter x width)		(mm)	150 x 55	150 x 55	150 x 55
3.5	Number of wheels, load / drive side (x = driven)		` '	1 x + 2 / 4	1 x + 2/ 4	1 x + 2 / 4
3.6	Track width (centre of tyres), drive side	b10	(mm)	662	662	662
3.7	Track width (centre of tyres), load side	b11	(mm)	402	402	392
	Dimensions					
4.2a	Height with mast lowered	h1	(mm)	see tables	see tables	see tables
4.2b	Height	h1	(mm)	see tables	see tables	see tables
4.3	Free lift	h2	(mm)	see tables	see tables	see tables
4.4	Lift height	h3	(mm)	see tables	see tables	see tables
4.5	Height with mast extended	h4	(mm)	see tables	see tables	see tables
4.6	Initial lift	h5	(mm)	-		
4.7	Height to top of overhead guard	h6	(mm)	2310	2310	2310
4.8	Seat or stand height	h7	(mm)	230	230	230
4.10	Height of support legs	h8	(mm)	82	80	83
4.15	Fork height, fully lowered	h13	(mm)	89	87	90
4.19	Overall length	l1	(mm)	1995 1)	2069 1)	2118 1)
4.20	Length to fork face	12	(mm)	825 <sup>1)</sup>	899 1)	948 1)
4.21	Overall width	b1/b2	(mm)	940	940	940
4.22	Fork dimensions (thickness, width, length)	s/e/l	(mm)	70 / 180 / 1170	70 / 180 / 1170	70 / 195 / 1170
4.25	Outside width over forks (minimum / maximum)	b5	(mm)	570	570	570
4.32	Ground clearance at centre of wheelbase, (forks lowered)	m2	(mm)	32	25	23
4.33a	Working aisle width (Ast) with 1000 x 1200 mm pallets, load crosswise	Ast	(mm)	2475 <sup>2)</sup>	2548 <sup>2)</sup>	2593 <sup>2)</sup>
4.33b		Ast3	(mm)	2043 2)	2116 2)	2161 2)
4.34a	Working aisle width (Ast) with 800 x 1200 mm pallets, load lengthwise	Ast	(mm)	2409 2)	2481 2)	2527 2)
4.34b	Working aisle width (Ast3) with 800 x 1200 mm pallets, load lengthwise	Ast3	(mm)	2243 2)	2316 2)	2361 2)
4.35	Turning radius	Wa	(mm)	1643 <sup>2)</sup>	1716 ²)	1761 <sup>2)</sup>
5.1	Performance Travel speed, with / without load		km / h	10.0 / 10.0	10/10	9/9
5.2	Lifting speed, with / without load		m/s	0.21 / 0.37	0.15/0.32	0.12/0.22
5.3	Lowering speed, with / without load		m/s	0.55 / 0.41	0.45/0.42	0.33 / 0.30
5.8	Maximum gradeability with / without load		%	9.0/9.0	6.7/6.7	5.9/5.9
5.10	Service brakes (mechanical / hydraulic / electric / pneumatic)		70	Electric	Electric	Electric
0.10	Electric motors			Libbatio	LIOUTIO	Elocatio
6.1	Drive motor capacity (60 min. short duty)		kW	2.7	2.7	2.7
6.2	Lift motor output at 15% duty factor		kW	4.0	4.0	4.0
6.4	Battery voltage/capacity at 5-hour discharge		V / Ah	24 / 375-775	24 / 375-775	24 / 375-775
6.5	Battery weight		kg	330-610	330-610	330-610
6.6a	Energy consumption according to EN16796	K	Wh/h			
	Miscellaneous					
8.1	Type of drive control			AC	AC	AC
10.7	Level of noise at the ear level of the driver according to EN 12 053:2001 and EN ISO 4871 in work LpAZ		dB (A)	67.3	67.3	67.3
10.7.1	Level of noise at the ear level of the driver according to EN 12 053:2001 and EN ISO 4871, drive/lift/idle LpAZ		dB (A)	71.5/68.9/53.3	71.5/68.9/53.3	71.5/68.9/53.3



Ast = Wa + R + a

Ast3 = Wa + 16 - x + a

Ast = Working aisle width

Wa = Turning radius

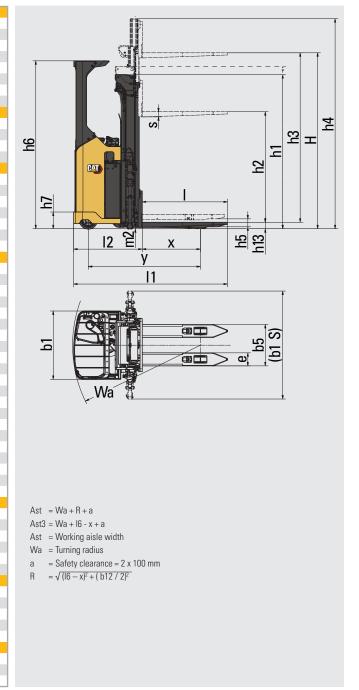
a = Safety clearance = 2 x 100 mm

 $R = \sqrt{(16 - x)^2 + (b12/2)^2}$ 

<sup>1)</sup> When SN/BC775 then add 104 mm.

<sup>2)</sup> Dimensions vary depending on battery carriage and mast type. Ast dimensions available in table on page 7.

	Characteristics		
	Manufacturer		
	Manufacturer's model designation		
	Power source		
	Operator type		
	Load capacity	0	(kg)
	Load centre distance	С	(mm)
8	Load wheel axle to fork face (forks lowered)	Х	(mm)
9	Wheelbase	У	(mm)
	Weight		
1a	Truck weight with load, with maximum battery weight		kg
1b	Truck weight without load, with maximum battery weight		kg
.2	Axle loadings with nominal load & maximum battery weight, drive / load side		kg
3	Axle loadings without load & with maximum battery weight, drive / load side		kg
	Wheels, drive train		
1	Tyres: PT = Power Thane, Vul = Vulkollan, P = Polyurethane, N = Nylon, R = Rubber drive / load side		
2	Tyre dimensions, drive side		(mm)
3	Tyre dimensions, load side	Ø	(mm)
4	Castor wheel dimensions (diameter x width)		(mm)
5	Number of wheels, load / drive side (x = driven)		
6	Track width (centre of tyres), drive side	b10	(mm)
7	Track width (centre of tyres), load side	b11	(mm)
	Dimensions		, ,
.2a	Height with mast lowered	h1	(mm)
.2b	Height	h1	(mm)
.3	Free lift	h2	(mm)
.4	Lift height	h3	(mm)
.5	Height with mast extended	h4	(mm)
.6	Initial lift	h5	(mm)
1.7	Height to top of overhead guard	h6	(mm)
.8	Seat or stand height	h7	(mm)
.10	Height of support legs	h8	(mm)
.15	Fork height, fully lowered	h13	(mm)
.19	Overall length	11	(mm)
20	Length to fork face	12	(mm)
21	Overall width	b1/b2	(mm)
22	Fork dimensions (thickness, width, length)	s/e/l	(mm)
.25	Outside width over forks (minimum / maximum)	b5	(mm)
.32	Ground clearance at centre of wheelbase, (forks lowered)	m2	(mm)
.33a		Ast	(mm)
.33b		Ast3	(mm)
34a		Ast	(mm)
.34b		Ast3	(mm)
35	Turning radius	Wa	(mm)
	Performance		
1	Travel speed, with / without load		km/h
.2	Lifting speed, with / without load		m/s
.3	Lowering speed, with / without load		m/s
.8	Maximum gradeability with / without load		%
.9	Acceleration time (10 metres) with / without load		S
.10	Service brakes (mechanical / hydraulic / electric / pneumatic)		
	Electric motors		
.1	Drive motor capacity (60 min. short duty)		kW
.2	Lift motor output at 15% duty factor		kW
6.4	Battery voltage/capacity at 5-hour discharge		V / Ah
6.5	Battery weight		kg
i.6a	Energy consumption according to EN16796		kWh/h
	Miscellaneous		
.1	Type of drive control		
0.7	Level of noise at the ear level of the driver according to EN 12 053:2001 and EN ISO 4871 in work LpAZ		dB (A)
10.7.	Level of noise at the ear level of the driver according to EN 12 053:2001 and EN ISO 4871, drive/lift/idle LpAZ		dB (A)



<sup>1)</sup> When SN/BC775 then add 104 mm.

<sup>2)</sup> Dimensions vary depending on battery carriage and mast type. Ast dimensions available in table on page 7.

NSR12N2								
Mast Type	h3+h13	h1	h4	h2+h13				
	mm	mm	mm	mm				
DS	3290	2157	3720	159 (h2=70)				
	3590	2307	4020	159 (h2=70)				
	4190	2607	4620	159 (h2=70)				
DEV	3290	2157	3720	1726				
	3590	2307	4020	1876				
	4190	2607	4620	2176				

NSR12N2I								
Mast Type	h3+h13	h1	h4	h2+h13				
	mm	mm	mm	mm				
DS	3290	2162	3725	163 (h2=70)				
	3590	2312	4025	163 (h2=70)				
	4190	2612	4625	163 (h2=70)				
DEV	3290	2162	3725	1730				
	3590	2312	4025	1880				
	4190	2612	4625	2180				

# Mast Performance and Capacity

DS Duplex with clear-view mast
DEV Duplex with full free lift
TREV Triplex with full free lift
h3+h13 Lifting height
Lowered mast height
h4 Raised mast height

h2+h13 Free lift

NSR16N2 - NSR20N2									
Mast Type	h3+h13	h1	h4	h2+h13					
	mm	mm	mm	mm					
DEV	3600	2350	4105	1847					
	4200	2650	4705	2147					
	4500	2800	5005	2297					
TREV	4800	2150	5332	1667					
	5400	2350	5932	1867					
	5700	2450	6232	1967					
	6300	2650	6832	2167					
	7000	2883	7532	2400					

NSR16N2I - NSR20N2I									
Mast Type	h3+h13	h1	h4	h2+h13					
	mm	mm	mm	mm					
DEV	3600	2355	4112	1853					
	4200	2655	4712	2153					
	4500	2805	5012	2303					
TREV	4800	2155	5339	1673					
	5400	2355	5939	1873					
	5700	2455	6239	1973					
	6300	2655	6839	2173					
	7000	2888	7539	2406					

AST dimensions, VDI2198 (4.34a)								
Basic capacity (kg)		1250	1600		2000			
Chassis / Battery carriage		Junior /	Junior /	Senior /	Junior/	Senior /		
Mast type	Initial lift	BC 465	BC 465	BC 775	BC 465	BC 775		
Duplex	No	2409	N/A	N/A	N/A	N/A		
Duplex with free lift	No	2409	2481	2583	2527	2631		
Triplex with free lift	No	N/A	2481	2583	2527	2631		
Duplex	Yes	2486	N/A	N/A	N/A	N/A		
Duplex with free lift	Yes	2486	2525	2626	2556	2684		
Triplex with free lift	Yes	N/A	2525	2626	2556	2684		

AST dimensions, Ast3 (4.34b)								
Basic capacity (kg)		1250	1600		2000			
Chassis / Battery carriage		Junior /	Junior /	Senior/	Junior/	Senior /		
Mast type	Initial lift	BC 465	BC 465	BC 775	BC 465	BC 775		
Duplex	No	2243	N/A	N/A	N/A	N/A		
Duplex with free lift	No	2243	2316	2417	2361	2465		
Triplex with free lift	No	N/A	2316	2417	2361	2465		
Duplex	Yes	2320	N/A	N/A	N/A	N/A		
Duplex with free lift	Yes	2320	2359	2460	2390	2518		
Triplex with free lift	Yes	N/A	2359	2460	2390	2518		



## **LI-ION BATTERIES**

### TIME TO SWITCH?



Lithium-ion (Li-ion) battery technology is available in the Cat® electric counterbalance and warehouse truck ranges. While lead-acid batteries remain a popular choice for our customers, and still have much to offer, they present various challenges which Li-ion can overcome.

Perhaps the most noticeable change when switching to Li-ion is the use of opportunity charging. Instead of exchanging batteries between shifts, you can simply plug into a fast charger during short breaks and keep the same battery going 24/7. This, together with other efficiency, environmental and safety benefits, makes Li-ion a very appealing alternative.



LONGER LIFE



HIGHER EFFICIENCY



LONGER RUNTIME



CONSISTENT PERFORMANCE



FASTER CHARGING



NO BATTERY CHANGING



NO DAILY MAINTENANCE



INBUILT PROTECTION

#### Cat Li-ion advantages over lead-acid

Li-ion is an investment which should be viewed against ongoing savings on energy, equipment, labour and downtime.

- Longer life 3 to 4 times lead-acid lifespan reduces overall battery investment
- **Higher efficiency** energy losses during charging and discharging are up to 30% lower, so electricity consumption is reduced
- Longer runtime thanks to more efficient battery performance and use of opportunity charges, which can be given at any time without damaging the battery or shortening its lifespan
- **Consistently high performance** with a more constant voltage curve maintains greater truck productivity, even toward the end of a shift
- Faster charging enables full charge in as little as 1 hour with the fastest chargers
- No battery changing fast opportunity charges 15 minutes for several hours of extra runtime enable
  continuous operation with just one battery and minimise the need to buy, store and maintain spares
- **No daily maintenance** the battery stays on board the truck for charging and there is no need for water top-ups or electrolyte checks
- No gas or acid spills avoids the space, equipment and running costs of a battery room and ventilation system
- **Inbuilt protection** intelligent battery management system (BMS) automatically prevents excessive discharge, charge, voltage and temperature, as well as virtually eliminating misuse

Batteries and chargers with different capacities are available. Your dealer will identify the best combination for your needs. You should also ask your dealer about optional 5-year warranties, subject to annual checkups, which give extra peace of mind.

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VIDEOS



