

Systems & Services Nitrogen Charging Units N₂-Servers



Nitrogen Charging Units N₂-Servers

HYDAC N₂-Servers enable simple and efficient charging of the required pre-charge pressures in bladder, diaphragm and piston accumulators. They guarantee optimal utilisation of standard commercial nitrogen bottles up to a residual pressure of 20/35 bar and a maximum pre-charge pressure of 160 to 470 bar.

General

Every hydraulic accumulator loses its pre-charge pressure over time. This is because of leakage/diffusion from the gas side to the oil side. Also, it is necessary to relieve the pre-charge pressure completely as part of periodic inspections or maintenance work. To restore perfect function of the hydraulic accumulator, it needs to be recharged with nitrogen. Standard nitrogen bottles generally have a pressure of 200 bar, which means that hydraulic accumulators with a pre-charge pressure greater than 200 bar cannot be pre-charged without additional tools. Even for lower pre-charge pressures, poor utilisation of the nitrogen bottle is achieved, as a relatively high residual pressure normally remains.

HYDAC provides nitrogen charging units (N₂-Servers) to enable better utilisation of the nitrogen bottles up to a residual pressure of 20/35 bar with a maximum pre-charge pressure of up to 470 bar (depending on the model of the N₂-Server).

Description

The N₂-Servers consist of an oil supply unit with downstream piston accumulator that serves as a compressor for the nitrogen. A digital display allows the desired pre-charge pressure to be set and the charging process to be started. Once the set pre-charge pressure has been reached, the charging process ends automatically. In addition to improving ease of use, priority has been given to ergonomic handling and flexible use both in workshops and for service calls.

Our N₂-Servers are suitable both for charging and for supplementing the pre-charge pressure in all standard diaphragm, bladder and piston accumulators and also accumulator stations (bladder and piston accumulator stations).

Model versions

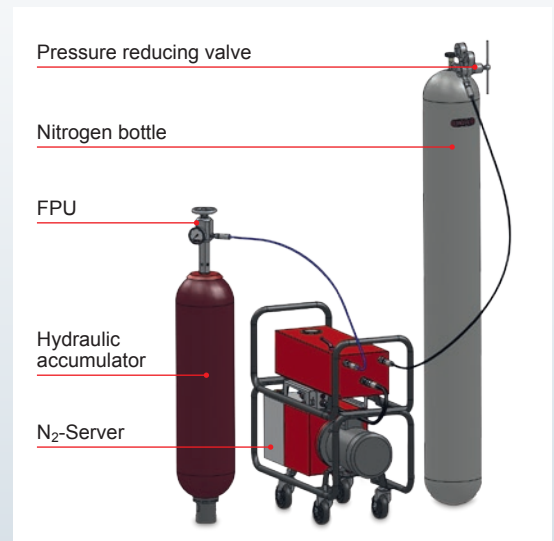
The HYDAC N₂-Server product range is suited to diverse applications and includes mobile, portable, stackable and stationary model versions in various pressure and charging-speed levels:

- N2S-MN N₂-Server mobile, low-pressure version
- N2S-M N₂-Server mobile
- N2S-V N₂-Server two-part, mobile, portable and stackable
- N2S-VH N₂-Server two-part, mobile, portable and stackable, high-pressure version
- N2S-F N₂-Server mobile
- N2S-S N₂-Server stationary

Safety information

If the pressure in the nitrogen bottles is greater than the permitted operating pressure of the hydraulic accumulator, a pressure reducing valve must be used.

The pressure reducing valve must be installed at the nitrogen bottle directly and set to the permitted operating pressure of the hydraulic accumulator to be charged.



Charging hose for nitrogen bottles

Type	Length [m]	Part no.
F (up to 200 bar)	2.5	236514
	10.0	373405
	15.0	2115552
FW (up to 300 bar)	2.5	3019419

Charging hose, accumulator

Type	Length [m]	Part no.
DN4-1004MK1-DN4-10000	10.0	6060332
DN4-1004MK1-DN4-15000	15.0	6060333

Pressure reducing valve for 200 bar nitrogen bottles

Starting pressure [bar]	Pressure after reducer [bar]	Part no.
200	20	635409
	100	635411
	170	635412

Pressure reducing valve for 300 bar nitrogen bottles

Starting pressure [bar]	Pressure after reducer [bar]	Part no.
300	20	6004020
	100	6004021
	170	6004022

Extension cable

	Length [m]	Part no.
100V-130V-2P+PE	5.0	4498098
	10.0	4498099
200V-250V-2P+PE	5.0	4379895
	10.0	4379896
380V-415V-3P+PE	5.0	4379703
	10.0	4379704
380V-415V-4P+PE	5.0	4497953
	10.0	4497954
440V-3P+PE	5.0	4498096
	10.0	4498097
480V-500V-3P+PE	5.0	4498100
	10.0	4498101

Model code

N2S - M - 320 - 400/50/30 - 4X - 4 - 4 - DEU

Product

N2S Nitrogen charging unit

Model version

MN Mobile nitrogen charging unit, low-pressure version
M Mobile nitrogen charging unit
V Mobile nitrogen charging unit, stackable
VH Mobile nitrogen charging unit, stackable, high-pressure version
F Mobile nitrogen charging unit
S Stationary nitrogen charging unit

Nitrogen charge pressure

160 160 bar (currently only available in model version MN)
320 320 bar
470 470 bar (currently only available in model version VH)

Motor voltage

110/50/1 110 volt – 50 hertz – 1-phase
220/50/1 220 volt – 50 hertz – 1-phase
230/50/1 230 volt – 50 hertz – 1-phase
230/50/3 230 volt – 50 hertz – 3-phase
380/50/3 380 volt – 50 hertz – 3-phase
400/50/3 400 volt – 50 hertz – 3-phase
415/50/3 415 volt – 50 hertz – 3-phase
220/60/1 220 volt – 60 hertz – 1-phase
120/60/1 120 volt – 60 hertz – 1-phase
110/60/3 110 volt – 60 hertz – 3-phase
220/60/3 220 volt – 60 hertz – 3-phase
480/60/3 480 volt – 60 hertz – 3-phase

Other voltages are available on request!

Series

XX series (determined by manufacturer)

Hose length, bottle side

4 4 metres

Other hose lengths are available on request!

Hose length, accumulator side

4 4 metres (standard for nitrogen charging pressure 160/320 bar)
6 6 metres (standard for nitrogen charging pressure 470 bar)

Other hose lengths are available on request!

Country code

AUT Austria
CHN China
CZE Czech Republic
DEU Germany
ESP Spain
FRA France
GBR UK
IND India
ITA Italy
KOR Korea
MEX Mexico
NLD Netherlands
RUS Russia
TWN Taiwan

Other country codes in accordance with ISO 3166 ALPHA-3.

Example calculation

The customer wants to charge a bladder accumulator SB330 with nominal volume 50 l to 180 bar. For charging, he uses standard nitrogen bottles with nominal volume 50 l and nominal pressure 200 bar.

Without N₂-Server

N ₂ bottle	Accumulator pressure	Residual pressure N ₂ bottle	Efficiency N ₂ bottle
0	0	200	0 %
1	100	100	50 %
2	150	150	25 %
3	175	175	13 %
4	180	195	3 %
			23 %

With N₂-Server

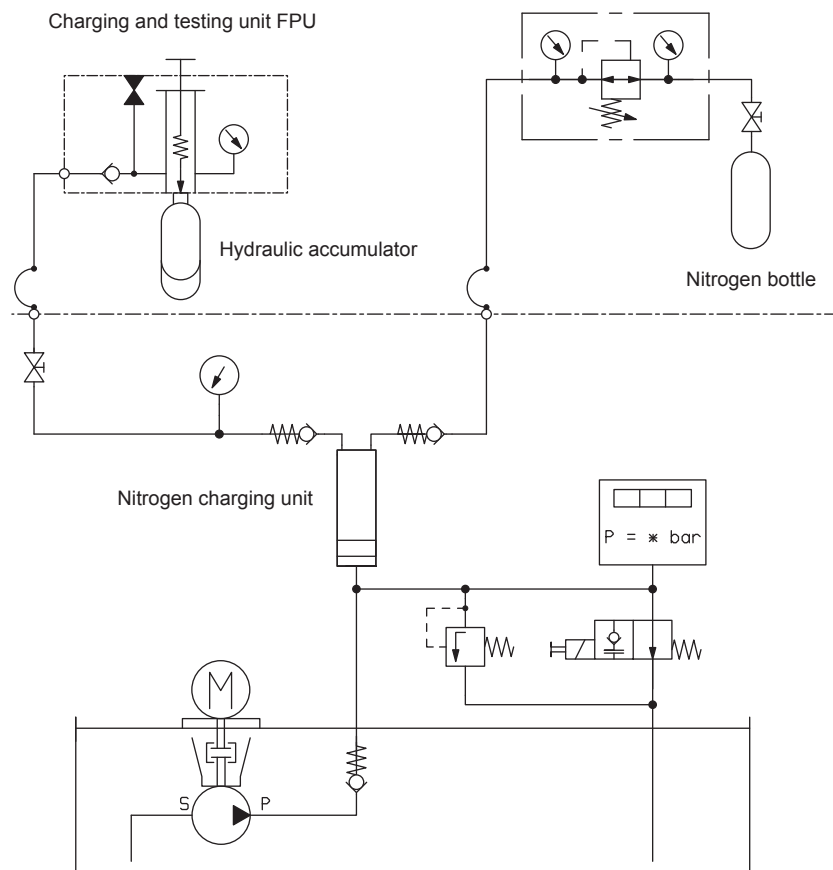
Charging cycles	Accumulator pressure	Residual pressure N ₂ bottle	Efficiency N ₂ bottle
0	0	200	0 %
1	180	20	90 %

- Efficiency without N₂-Server 23 %, with N₂-Server 90 %
- With a nitrogen bottle price of 300.00 EUR, the N₂-Server saves 900.00 EUR
- Amortisation time for N2S-M: charging of nine bladder accumulators SB330 with 50 l nominal volume

Charge-IT² – N₂-Server selection tool

With the Charge-IT² we are providing a user-friendly selection tool for finding a suitable N₂-Server for your application. The tool calculates the charging times of our various N₂-Server model versions on the basis of the parameters entered previously (accumulator volume, starting pressure, charging pressure).

Principle of operation



CAUTION: Observe safety information for using a pressure reducing valve in the operating instructions!



N2S-MN

N₂-Server mobile / low-pressure version

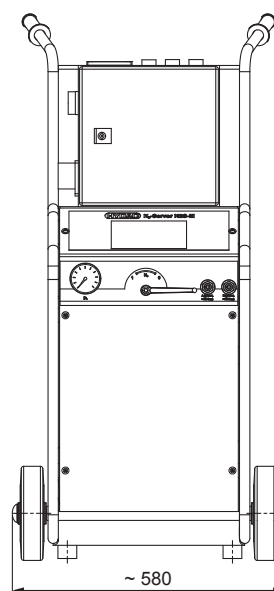
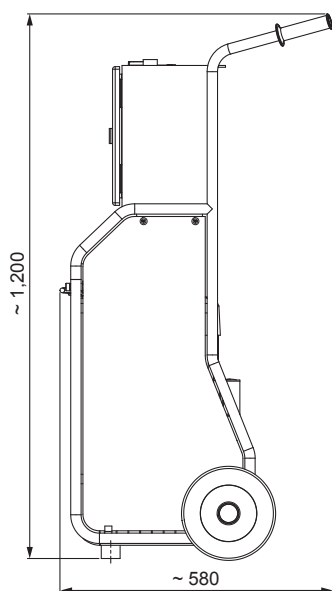
N2S-M

N₂-Server mobile

Suitable for charging individual hydraulic accumulators or for supplementing the pre-charge pressure of individual hydraulic accumulators or accumulator stations.

The N₂-Server consists of an oil supply unit, an electric and hydraulic control unit, a piston accumulator and connecting hoses. The hydraulic and electrical controls are ergonomically positioned, with all of them located on the front.

The N₂-Server N2S-M or MN is extremely compact and can easily be moved by one person thanks to its design with a stable, light-weight tubular frame and aluminium Dibond panelling. Furthermore, the ergonomic handles enable optimum handling that is gentle on the back.



N2S-MN

N2S-M

General	N2S-MN	N2S-M
Total weight of unit (when filled with oil):	~ 55 kg	~ 65 kg
Dimensions:	~ 580 x 580 x 1,200 mm	~ 580 x 580 x 1,200 mm
Ambient temperature:	-15 °C to +50 °C	-15 °C to +50 °C
Hydraulic		
Nitrogen charge pressure:	160 bar	320 bar
Permitted pressure:	200 bar	350 bar
Pressure gauge measuring range:	0 – 250 bar	0 – 400 bar
Flow rate:	~ 1 l/min	~ 0.9 l/min
Tank content:	~ 6.5 l	~ 8 l
Hose connection, bottle side:	W 24.32 x 1/14"	W 24.32 x 1/14"
Hose connection, accumulator side:	Union nut M 14 x 1.5 ISO4834	Union nut M 14 x 1.5 ISO4834
Hose length, bottle side:	4 m	4 m
Hose length, accumulator side:	4 m	4 m
Piston accumulator volume:	1 l	1 l
Electrical		
Supply voltage:	400 V – 50 Hz – 3 ph.	400 V – 50 Hz – 3 ph.
Power:	0.37 kW	0.75 kW
Protection class:	IP 44	IP 44
Electrical connection:	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable
Delivery	With oil filling	With oil filling



N2S-F

N₂-Server mobile

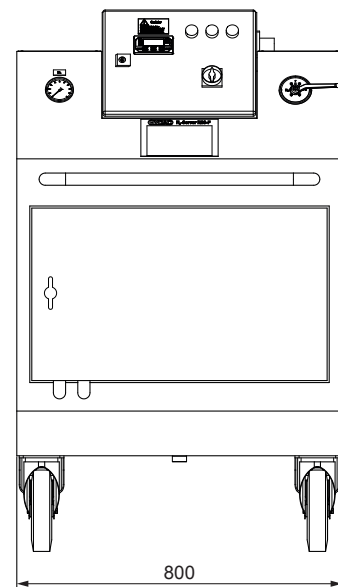
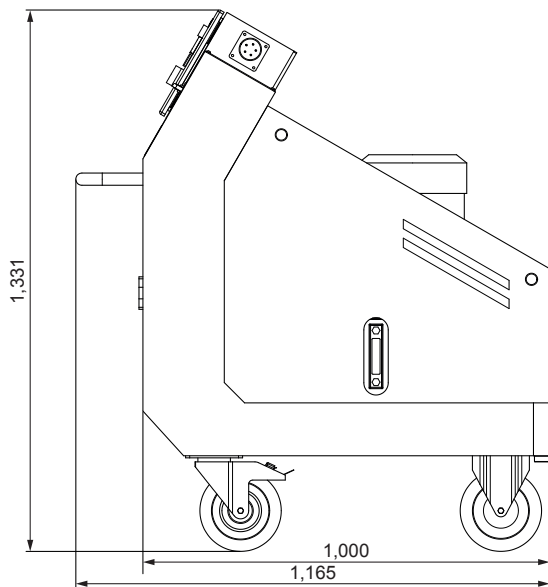
N2S-S

N₂-Server stationary

Suitable for charging individual piston accumulators of all sizes and large accumulator stations (piston or bladder accumulators). For the use of other types of hydraulic accumulator, please contact us.

The N₂-Server consists of an oil supply unit, an electric and hydraulic control unit, a piston accumulator and hoses arranged on a compact carriage/frame.

A charging and testing unit FPU-1 is included in the scope of delivery. The optimised design (with cooling tube) reduces temperature build-up during the compression process.



N2S-F

N2S-S

General	N2S-F	N2S-S
Total weight of unit (without oil):	~ 310 kg	~ 310 kg
Dimensions:	~ 1,200 x 800 x 1,350 mm	~ 1,200 x 800 x 1,350 mm
Ambient temperature:	-15 °C to +50 °C	-15 °C to +50 °C
Hydraulic		
Nitrogen charge pressure:	320 bar	320 bar
Permitted pressure:	350 bar	350 bar
Pressure gauge measuring range:	0 – 400 bar	0 – 400 bar
Flow rate:	~ 8 l/min	~ 8 l/min
Tank content:	~ 40 l	~ 40 l
Hose connection, bottle side:	W 24.32 x 1/14"	W 24.32 x 1/14"
Hose connection, accumulator side:	Union nut M 14 x 1.5 ISO4834	Union nut M 14 x 1.5 ISO4834
Hose length, bottle side:	4 m	4 m
Hose length, accumulator side:	4 m	4 m
Piston accumulator volume:	2.5 l	2.5 l
Electrical		
Supply voltage:	400 V – 50 Hz – 3 ph.	400 V – 50 Hz – 3 ph.
Power:	5.5 kW	5.5 kW
Protection class:	IP 44	IP 44
Electrical connection:	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable
Delivery	Without oil	Without oil



N2S-V

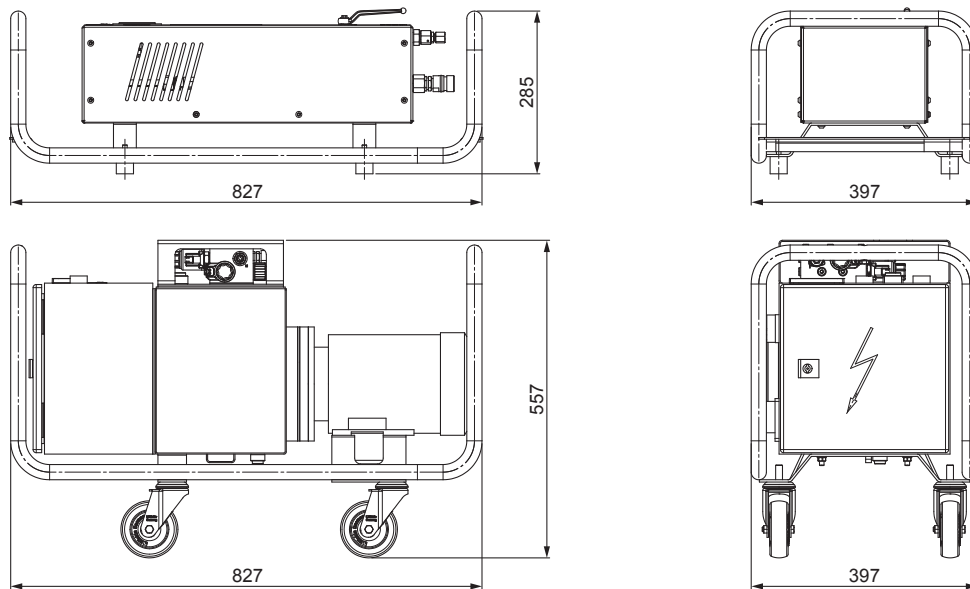
N₂-Server two-part /
mobile, portable and stackable

N2S-VH

N₂-Server two-part /
mobile, portable and stackable /
high-pressure version

Suitable for charging individual hydraulic accumulators or for supplementing the pre-charge pressure of individual hydraulic accumulators or accumulator stations.

The N₂-Server is made up of an oil supply unit, a compressor and a hose set consisting of a connection hose and two charging hoses. The unit's main advantages are its compact size and low weight. The supply unit and compressor can be transported separately by one person and reconnected with a hose at the operating location.



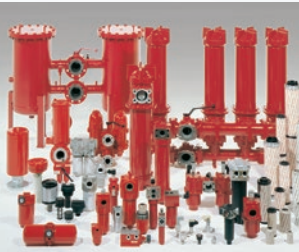
N2S-V

N2S-VH

General	N2S-V	N2S-VH
Total weight of unit (when filled with oil):	~ 55 kg (supply unit) + 30 kg (compressor)	~ 55 kg (supply unit) + 30 kg (compressor)
Dimensions:	~ 850 x 400 x 800 mm	~ 850 x 400 x 800 mm
Ambient temperature:	-15 °C to +50 °C	-15 °C to +50 °C
Hydraulic		
Nitrogen charge pressure:	320 bar	470 bar
Permitted pressure:	350 bar	500 bar
Pressure gauge measuring range:	0 – 400 bar	0 – 630 bar
Flow rate:	~ 1.5 l/min	~ 0.9 l/min
Tank content:	~ 13 l	~ 13 l
Hose connection, bottle side:	W 24.32 x 1/14"	W 24.32 x 1/14"
Hose connection, accumulator side:	Union nut M 14 x 1.5 ISO4834	Adapter 9/16-18 UNF
Hose length, bottle side:	4 m	4 m
Hose length, accumulator side:	4 m	6 m
Piston accumulator volume:	1.5 l	1 l
Electrical		
Supply voltage:	400 V – 50 Hz – 3ph.	400 V – 50 Hz – 3 ph.
Power:	1.5 kW	1.1 kW
Protection class:	IP 44	IP 44
Electrical connection:	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable	CEE male connector, 5-pin, 16 amp for 400 V Flange connector plug without cable
Delivery	With oil filling	With oil filling



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Filter Technology 70,000



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Note

The information in this brochure relates to the operating conditions and applications described. For applications and / or operating conditions not described, please contact the relevant technical department. All technical details are subject to change without notice.