

HYDAC INTERNATIONAL

Systems & Services Nitrogen charging units N₂-Server



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Knowledge is POWER – Motion Force Control is our Business

HYQUIP Limited New Brunswick Street Horwich Bolton Lancashire BL6 7JB UK

Nitrogen charging units N2-Server

HYDAC N2-Servers enable simple and efficient charging of the required pre-charge pressure 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 information

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 must 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, a bad nitrogen bottle operating ratio is achieved, as a relatively high residual pressure normally remains.

With its nitrogen charging units (N2-Server), HYDAC enables better utilisation of the nitrogen bottles up to a residual pressure of 20 or 35 bar with a maximum pre-charge pressure of up to 470 bar (depending on model version of the N2-Server).

Description

The N2-Servers consist of an oil supply unit with downstream piston accumulator functioning as a compressor for the nitrogen. A digital display allows the desired pre-charge pressure to be set and the charging pressure 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 for charging and for supplementing the pre-charge pressure in all conventional diaphragm, bladder and piston accumulators and also accumulator stations (bladder and piston accumulator stations).

Model versions

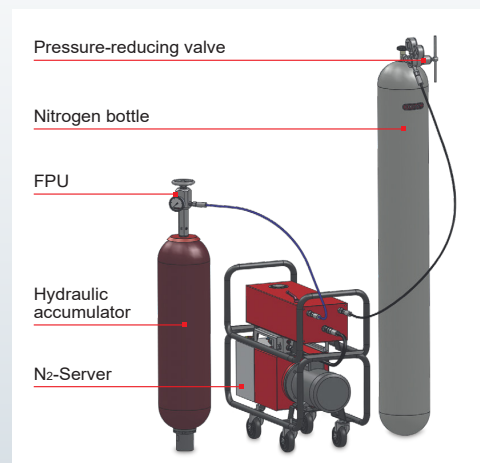
The HYDAC N2-Server range is tailored for various purposes and covers mobile, portable, stackable and stationary model versions with different pressure and charging speed ratings:

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

Safety information

If the nitrogen bottle's charge pressure 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]	Back pressure [bar]	Part no.
200	20	635409
	100	635411
	170	635412

Pressure reducing valve for 300 bar nitrogen bottles

Starting pressure [bar]	Back pressure [bar]	Part no.
300	20	6004020
	100	6004021
	170	6004022

Extension cable

	Length [m]	Part no.
100-130V-16A-3p-4h	5.0	4498098
	10.0	4498099
200-250V-16A-3p-6h	5.0	4379895
	10.0	4379896
200-250V-16A-4p-9h	5.0	4508679
	10.0	4508680
380-415V-16A-5p-6h	5.0	4497953
	10.0	4497954
440-460V-16A-5p-11h	5.0	4498096
	10.0	4498097
480-500V-16A-4p-7h	5.0	4498100
	10.0	4498101

Model code

N2S - M - 320 - 400 / 50 / 3 - XX - 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, the customer 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	Operating ratio N ₂ bottle
0	0	200	0 %
1	100	100	50 %
2	150	150	25 %
3	175	175	13 %
4	180	195	3 %
			23 %

N₂-Server

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

- Operating ratio without N₂-Server 23 %, with N₂-Server 90 %
- At a price of 300 EUR per N₂ bottle, the N₂-Server saves 900 EUR
- Pay-back period for N2S-M: Charging nine bladder accumulators SB330 with 50 l nominal volume

Charge-IT² – N₂-Server selection aid

HYDAC SYSTEMS & SERVICES

CHARGE-IT²

Accumulator to be charged

Accumulator volume V
 l

Starting pressure P_A
 bar

Charge pressure P_L
 bar

N₂ Nitrogen source

Nitrogen source

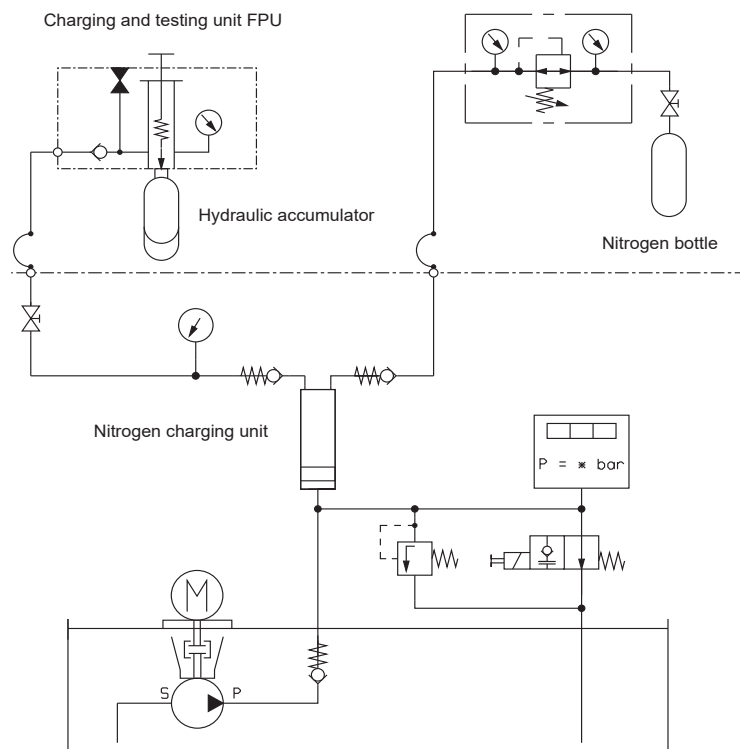
Nominal pressure
 bar

Calculate

With the Charge-IT² we are providing a user-friendly selection aid for finding a suitable N₂ server for your application. The program calculates the charging times of our various N₂server model versions on the basis of the parameters entered previously (accumulator volume, starting pressure, charging pressure).

► Available on our website → www.hydac.com/de-de/online-tools/charge-it2/

Functional principle



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



N2S-MN

N2-Server mobile / low-pressure version

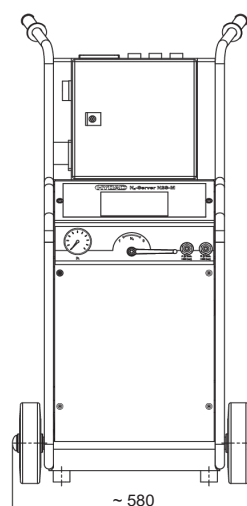
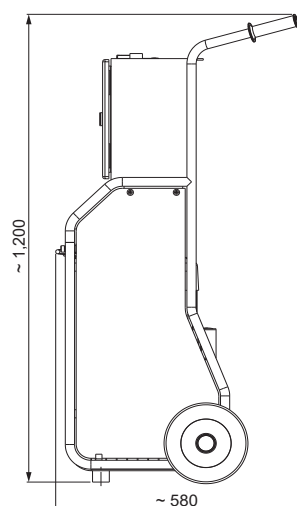
N2S-M

N2-Server mobile

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

The N2-Server consists of an oil supply unit, the electrical and hydraulic control, the piston accumulator and the connection 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 thanks to its design with a stable, lightweight tube frame and Alu Dibond cladding it can easily be moved by one person. Furthermore, the ergonomic handles enable optimum handling that is gentle on the back.



N2S-MN

N2S-M

General information	N2S-MN	N2S-M
Total weight of unit (when filled with oil):	~ 55 kg	~ 65 kg
Unit 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 capacity:	~ 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 plug connector, 5-pin, 16 amp for 400 V Flange connector plug without cable	CEE plug 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

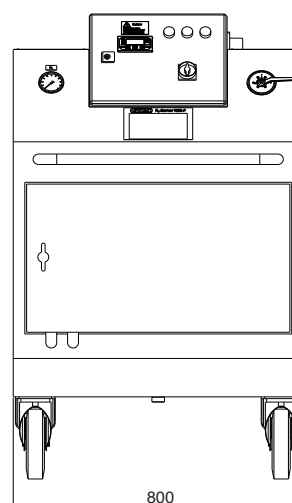
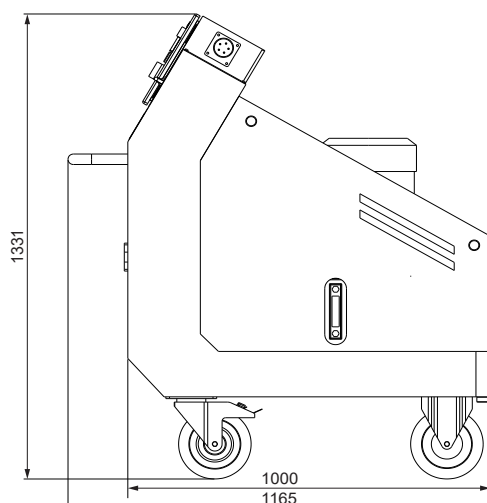
N2S-S

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, with its complete drive unit, piston accumulator, electrical controller and hoses, can be set up on a carriage or frame with compact dimensions.

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



N2S-F

N2S-S

General information		
Total weight of unit (without oil):	~ 310 kg	~ 310 kg
Unit 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 capacity:	~ 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 plug connector, 5-pin, 32 amp for 400 V	CEE plug connector, 5-pin, 32 amp for 400 V
	Flange connector plug without cable	Flange connector plug without cable
Delivery	Without oil	Without oil



N2S-V

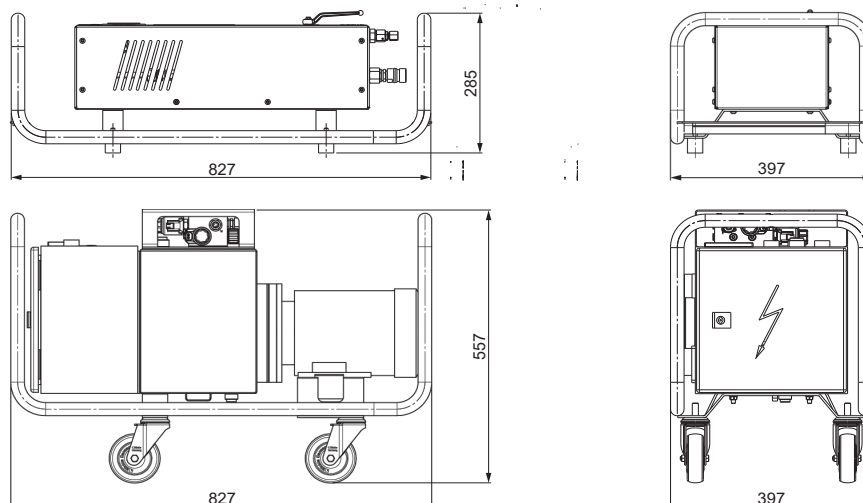
N₂-Server Server two-piece /
mobile, portable and stackable

N2S-VH

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

Suitable for charging individual hydraulic accumulators or for supplementing the gas 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

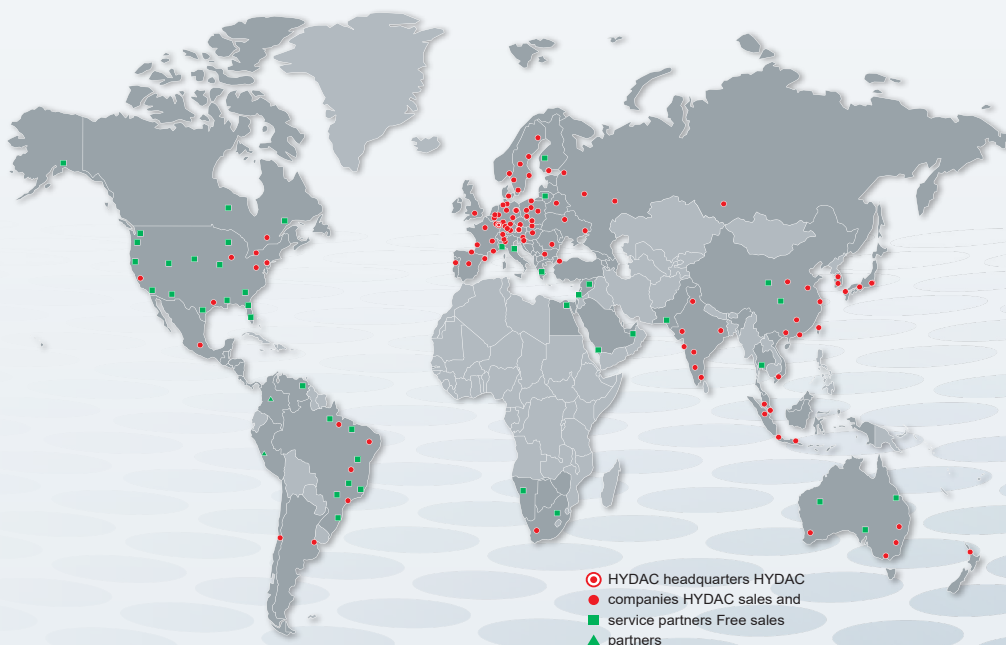
General information		
Total weight of unit (when filled with oil):	~ 55 kg (supply unit) + 30 kg (compressor)	~ 55 kg (supply unit) + 30 kg (compressor)
Unit dimensions:	~ 850 x 400 x 800 mm	~ 850 x 400 x 800 mm
Ambient temperature:	-15 °C to +50 °C	-15 °C to +50 °C
Hydraulic		
Nitrogen charge pressure:	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 capacity:	~ 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:	1.1 kW	1.1 kW
Protection class:	IP 44	IP 44
Electrical connection:	CEE plug connector, 5-pin, 16 amp for 400 V	CEE plug connector, 5-pin, 16 amp for 400 V
	Flange connector plug without cable	Flange connector plug without cable
Delivery	With oil filling	With oil filling

Goals achieved safely with HYDAC

HYDAC offers the best of both worlds: with over 60 years of expertise as a fluid technology, hydraulics and electronics company and the dynamism of a start-up, we devote our energies to the technologies of the future. From hydrogen applications to the electrification of mobile machines.

10,000 employees, 50 HYDAC subsidiaries and more than 500 sales and service partners ensure that HYDAC is on hand to help you as a reliable partner worldwide. The delivery programme extends from components through subsystems right up to complex drive units with closed-loop-control for mobile and stationary machines and systems. We also offer our customers a large range of technical services relating to HYDAC fluid engineering for hydraulic oil, lubricants, coolants and water.

Trust in on our expert global network and our top quality standards.



INTERNATIONAL

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Comment

The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

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