

Two-stage valve type NE

Product documentation



Operating pressure p_{\max} :	700 bar (High pressure) 80 bar (Low pressure)
Flow rate Q_{\max} :	25 lpm (High pressure) 180 lpm (Low pressure)



© by HAWE Hydraulik SE.

The forwarding and reproduction of this document, as well as the use and communication of its contents, are forbidden unless expressly permitted.

Any breach or infringement will result in liability for damages.

All rights reserved concerning patent or utility model application.

Contents

1	Overview of two-stage valve type NE.....	4
2	Available versions, main data.....	5
3	Parameters.....	6
3.1	General.....	6
4	Dimensions.....	8
5	Assembly, operation and maintenance recommendations.....	10
5.1	Intended application.....	10
5.2	Assembly information.....	10
5.2.1	Attachment.....	11
5.2.2	Subsequent pressure adjustment.....	13
5.3	Operating instructions.....	14
5.4	Maintenance information.....	14
6	Other information.....	15

1 Overview of two-stage valve type NE

Two-stage valves are a type of pressure control valve. They are used in hydraulic systems that are supplied by dual stage pumps, a combination of high-pressure pump and low-pressure pump.

The two-stage valve type NE combines the two pump delivery flows into a common volumetric flow. It switches the low-pressure pump to unpressurised circulation if the pressure value set is reached. It protects both pumps against exceeding the high or low-pressure value set.

The two-stage valve type NE is used with directional valves to control double-acting hydraulic cylinders.

Features and benefits:

- Operating pressures up to 700 bar
- Direct mounting on hydraulic power packs
- Direct combination with valve banks

Intended applications:

- Presses
- Test benches
- Hydraulic tools

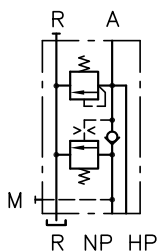


Two-stage valve type NE

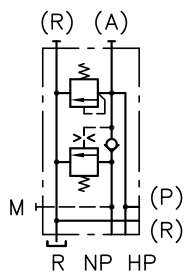
2 Available versions, main data

Circuit symbol:

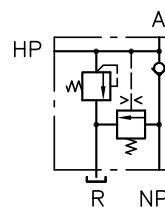
NE 20



NE 21



NE 70
NE 80



Order coding example:

NE 70 - 350/10

Pressure setting (bar)

Basic type and size Table 1 Basic type and size

Table 1 Basic type and size

Coding	Pressure range from ... to (bar)		Flow rate Q_{max} (lpm)	
	High pressure	Low pressure	High pressure	Low pressure
NE 20 NE 21	20 to 500 20 to 700	16 to 30 31 to 50 51 to 65 66 to 80	10	40
NE 70	20 to 500	10 to 30 31 to 60	16	100
NE 80	20 to 500	10 to 30	25	180

- Type NE 21 has the same design as type NE 20, but is suitable for direct mounting of valve banks type VB 11 G and VB 21 G in accordance with [D 7302](#).
- Note the max. flow rates of the valve banks.

3.1 General

General information

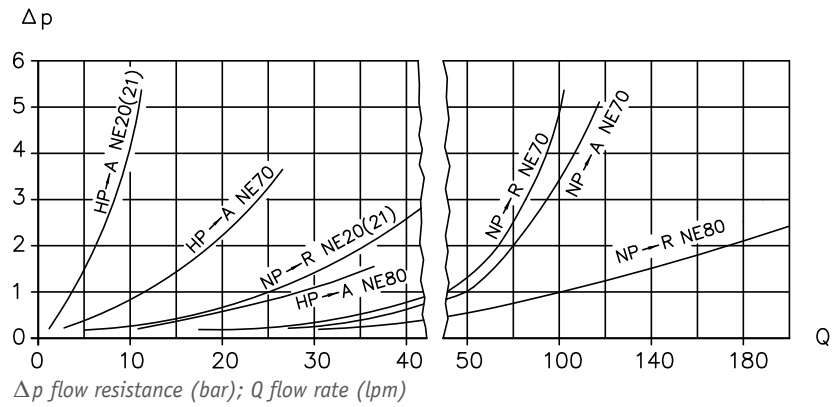
Designation	Two-stage valve
Design	Combinations of ball-seated check valves with ball-seated and piston-type pressure-limiting valves
Model	Pipe connection
Material	Steel; nitrided valve housing, electrogalvanised sealing nuts and connection block, hardened and ground functional inner parts Steel; valve housing galvanized zinc plated; hardened and ground functional inner parts
Tightening torques	See Chapter 4, "Dimensions"
Installation position	As desired
Line connection	<ul style="list-style-type: none"> ▪ HP and A: pipe screw connection series S DIN 2353 / DIN EN ISO 8434-1 ▪ NP and R: pipe screw connection series L DIN 2353 / DIN EN ISO 8434-1
Hydraulic fluid	Hydraulic oil: according to Part 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity limits: min. approx. 4, max. approx. 1500 mm ² /s opt. operation approx. 10... 500 mm ² /s. Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	ISO 4406 <hr style="width: 50%; margin-left: 0;"/> 21/18/15...19/17/13
Temperatures	Ambient: approx. -40 ... +80°C, Fluid: -25 ... +80°C, Note the viscosity range! Permissible temperature during start: -40°C (observe start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biologically degradable pressure fluids: Observe manufacturer's specifications. By consideration of the compatibility with seal material not over +70°C.

Characteristic curves

Oil viscosity approx. 60 mm²/s

Δp -Q characteristics

For viscosities above approx. 500 mm²/s, a stronger increase in the flow resistance must be taken into account.



Weight

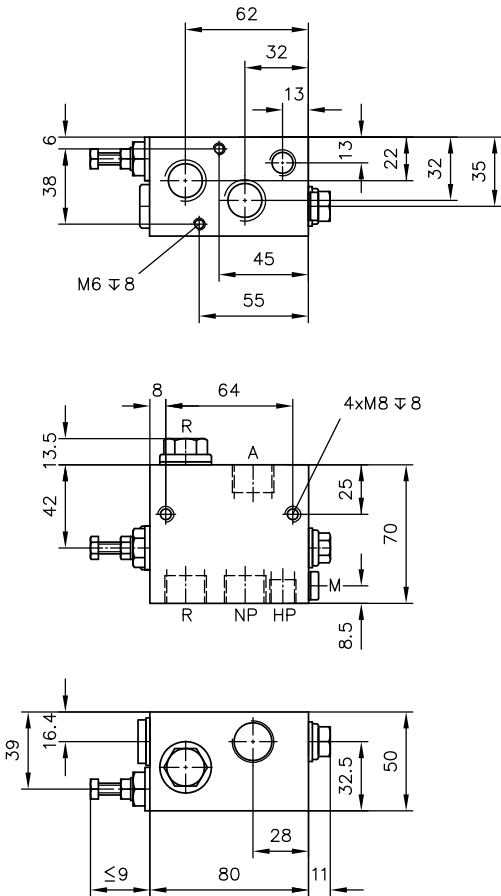
Type

NE 20	= 2.1 kg
NE 21	= 2.1 kg
NE 70	= 3.4 kg
NE 80	= 7.0 kg

4 Dimensions

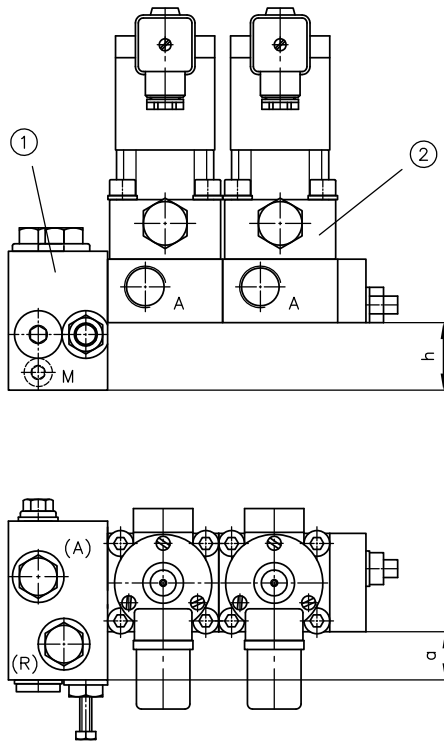
All dimensions in mm, subject to change.

NE 20



Ports ISO 228-1 (BSPP)	NP, A, R	HP	M
	G 1/2	G 1/4	G 1/8

NE 21



- 1 Type NE 21
- 2 Valve bank type VB 11 or VB 21 in accordance with [D 7302](#)

For missing dimensions, see type NE 20 or [D 7302](#)

For attachment of	a	h
VB 11G	--	48
VB 21G	22.5	35

5.1 Intended application

This valve is intended exclusively for hydraulic applications (fluid engineering). The valve meets high technical safety standards and regulations for fluid and electrical engineering.

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- The operating and maintenance manual of the specific complete system must also always be observed.

If the product can no longer be operated safely:

Remove the product from operation and mark it accordingly. It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard connection components that comply with market requirements (screw fittings, hoses, pipes, etc.).

The hydraulic system must be shut down correctly prior to dismantling; this applies in particular to hydraulic systems with hydraulic accumulators.

**Danger**

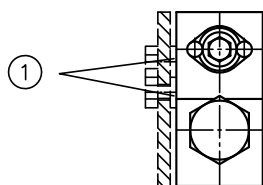
Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.2.1 Attachment

Attachment on mounting panel (example NE 70)

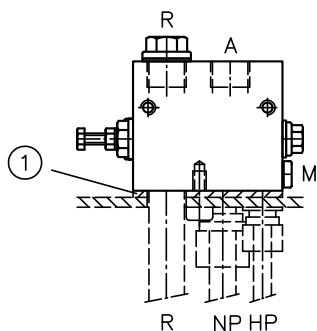


- 1 Flat washers to compensate for any unevenness

For threaded holes in the housing body, see "hole pattern"

Attachment on tank cover

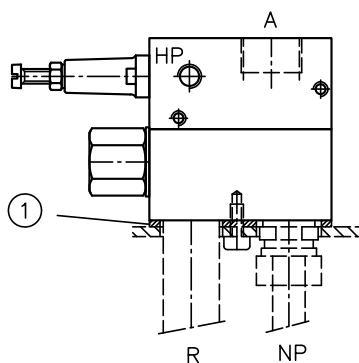
NE 20, NE 21



- 1 Abil seal
NE 20: Order no. 7223 050

Ports R, NP and HP enter directly from below

NE 70, NE 80 (example NE 70)

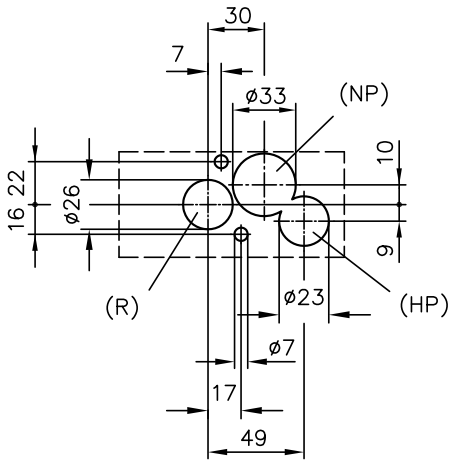


- 1 Abil seal
NE 70: Order no. 7161 050
NE 80: Order no. 7181 050

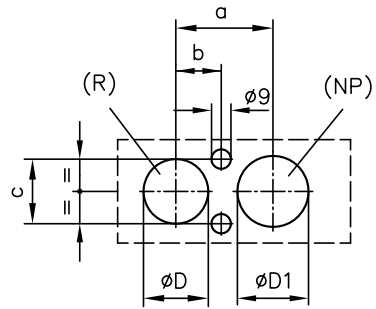
Route high-pressure line through the tank cover to side HP port using bulkhead fitting

Hole pattern

NE 20, NE 21



NE 70, NE 80



Type	ØD	ØD1	a	b	c
NE 70	36	38.5	44	20	26
NE 80		48.5	55	31	46

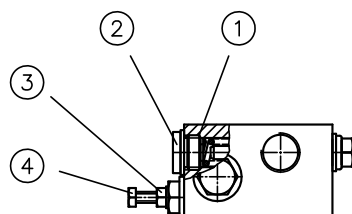
Hole pattern required in the lid for line connection holes (top view)

5.2.2 Subsequent pressure adjustment

Always monitor the pressure gauge when setting or changing the pressure yourself. The specified pressure change values per revolution or per millimetre of adjustment travel at the adjusting spindle are only rough indicative values for approximately finding the desired operating pressure.

Note
To ensure that the low-pressure idle circulation functions correctly, make sure that the high-pressure setting is always above the low-pressure setting. This also applies if the intended high-pressure end value is not yet being used, for example, during commissioning of the hydraulic system. Monitor the pressure gauge.

NE 20, NE 21



- 1 Perforated washer
- 2 Tapped plug
- 3 Lock nut SEAL-Lock
- 4 Setting screw

High-pressure adjustment:

Loosen lock nut
(at least 1 1/2 turns in order to free the vulcanized sealing lip from the thread turns).

Turn setting screw with a screw driver:

- Clockwise = pressure increases
- 1 revolution \approx 100 bar (pressure range 20 to 500 bar)
- 1 revolution \approx 170 bar (pressure range 20 to 700 bar)

and lock again.

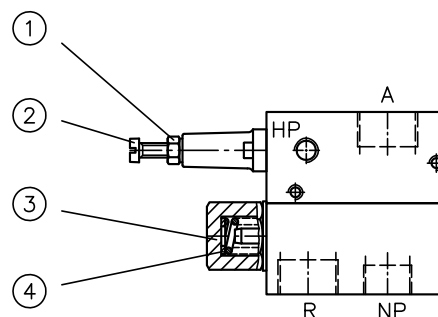
Low-pressure adjustment:

Unscrew tapped plug and add or remove perforated washers $\varnothing 16 \times \varnothing 10 \times 1$

- 1 mm \approx 2.5 bar (Pressure range 16 to 30 bar)
- 1 mm \approx 5 bar (Pressure range 31 to 50 bar)
- 1 mm \approx 9 bar (Pressure range 51 to 65 bar)
- 1 mm \approx 11 bar (Pressure range 66 to 80 bar)

Switching point can be checked at M with a pressure gauge

NE 70, NE 80



- 1 Lock nut
- 2 Setting screw
- 3 Hex spring housing
- 4 Washers

High-pressure adjustment:

Loosen lock nut

Turn setting screw with a screw driver:

- Clockwise = pressure increases
- 1 revolution \approx 80 bar (pressure range 20 to 500 bar)

and lock again.

Low-pressure adjustment:

Unscrew spring housing. Remove washers as required = pressure falls; or add washers = pressure increases

Type	Coding for washers	Pressure change per washer
NE 70	5650 005 (0.5 mm thick)	Approx. 4 bar
NE 80	Washer 13 DIN 125 (2.5 mm thick)	Approx. 2.5 bar



Caution

Risk of injury on overloading components due to incorrect pressure settings!

Risk of minor injury.

- Always monitor the pressure gauge when setting and changing the pressure.

5.3 Operating instructions

Product configuration and setting the pressure and flow rate

The statements and technical parameters in this documentation must be strictly observed.
The instructions for the complete technical system must also always be followed.



Note

- Read the documentation carefully before usage.
- The documentation must be accessible to the operating and maintenance staff at all times.
- Keep documentation up to date after every addition or update.



Caution

Risk of injury on overloading components due to incorrect pressure settings!

Risk of minor injury.

- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of a hydraulic power pack. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid



Note

Fresh hydraulic fluid from the drum does not always have the highest degree of purity. Under some circumstances the fresh hydraulic fluid must be filtered before use.

Pay attention to the cleanliness level of the hydraulic fluid in order to maintain faultless operation.
(Also see cleanliness level in [Chapter 3, "Parameters"](#).)

5.4 Maintenance information

This product is largely maintenance-free.

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

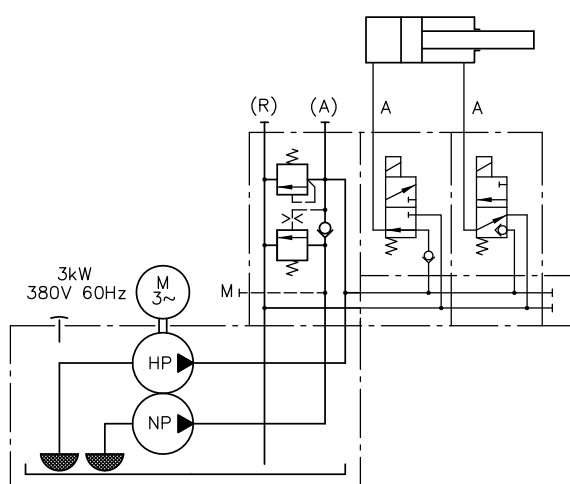
Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

6 Other information

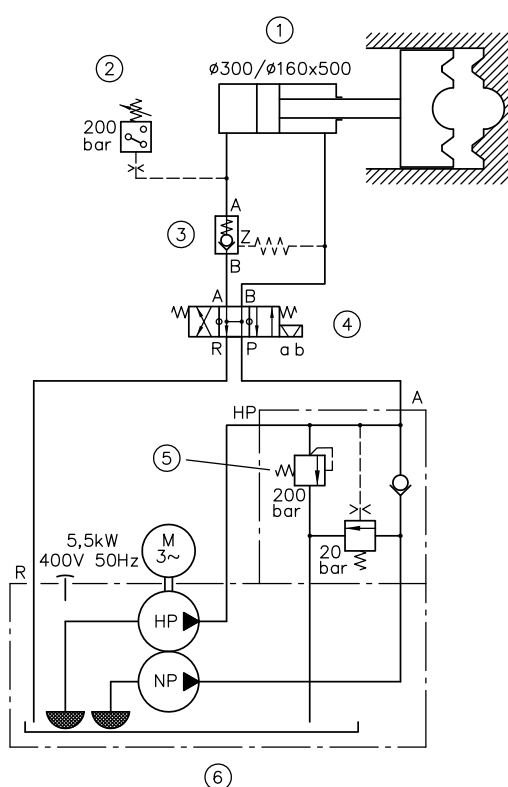
Application examples

Type NE 21 with valve bank VB 21 G. ([D 7302](#)); mounted on compact hydraulic power pack type MP ([D 7200 H](#))

Example: MP 44A - H1.4 Z16 / B55 - NE 21 - 700/20 -
- VB 21GM - RH-3G-G 24



Use of an NE 70 in a hydraulic mould closing device



- 1 Stroke
- 2 Type DG 1 in accordance with [D 5440](#)
- 3 Type RH 5V in accordance with [D 6105](#)
- 4 Type SG 5H - MD 3/.. in accordance with [D 5650/1](#)
- 5 Two-stage valve type NE 70
- 6 Type RZ 8.3/59 / B100-V5.5 - NE 70-200/20 in accordance with [D 6010 H](#)

Further information

Additional versions

- Pressure-controlled shut-off valve type CNE: D 7710 NE
- Connection blocks type A for hydraulic power packs: D 6905 A/1
- Valve bank (directional seated valve) type VB: D 7302
- Switch unit type CR: D 7150
- Compact hydraulic power pack type MPN and MPNW: D 7207
- Dual-stage pump type RZ: D 6910