Anti-cavitation valve type NSV

Product documentation

Operating pressure p_{max}:	320 bar
Flow rate Q_{max}:	900 l/min



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1 Overview of anti-cavitation valve type NSV

Pre-fill valves are check valves with hydraulic release. They are used, e.g. in top ram presses for suction and emptying the press cylinder on rapid closing and opening.

Anti-cavitation valves are used for filling and emptying the press cylinders of press brakes during opening and closing in rapid traverse mode. The HAWE anti-cavitation valves which are open in basic position are characterized by a high filling ratio. Control pressure is only required for closing the valves. The anti-cavitation valves are available for installation within the cylinder or for mounting on the cylinder.

Features and advantages

- Normally open contact (NO)
- Any installation position
- Easy-to-implement safety function

Intended applications

- Press control systems



Anti-cavitation valve type NSV..BE

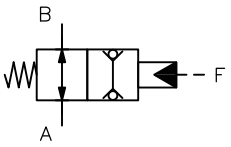


Anti-cavitation valve type NSV..BA

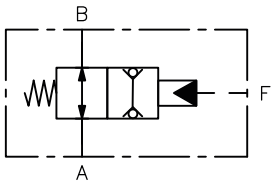
2 Available versions

Circuit symbol

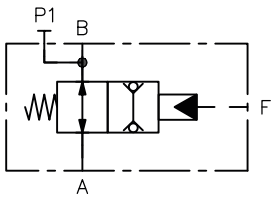
NSV..BE 03(05, 07, 10)



NSV..BA 03(05)



NSV..BA 07(10)



Ordering example

NSV	050	BE	05	L

2.5 "Seals"

2.4 "Size (Nominal size)"

2.3 "Model"

2.2 "Circuit symbol"

2.1 "Basic type "

2.1 Basic type

Type	Description	Pressure p_{max} (bar)	Flow rate Q_{max} (l/min)
NSV	Anti-cavitation valve	320	900

2.2 Circuit symbol

Coding	Description
050	▪ Pressure connection B ▪ Suction port A (not available in sizes 03 and 05)
060	▪ Pressure connection A ▪ Suction port B (in sizes 07 and 10, only available with BE fastening)

2.3 Model

Coding	Description
BE	▪ In-cylinder ▪ Slip-in cartridge valve (sizes 03 and 05, only available with circuit symbol 060)
BA	▪ On-cylinder ▪ Flange mounting (sizes 03 and 05, only available with circuit symbol 060) (sizes 07 and 10, only available with circuit symbol 050)

2.4 Size (Nominal size)

Coding	Nominal size	Flow rate Q_{max} (l/min) *
03	**32**	150
05	**50**	300
07	**75**	500
10	**100**	900

* Depending on the installation situation, pipe length, viscosity of the hydraulic fluid and suction height, these application limits for the anti-cavitation valves are recommended.

2.5 Seals

Coding	Description
without coding	▪ With seal ▪ Zero leakage
L	▪ Without seal ▪ With leakage flow

3 Parameters

3.1 General data

Design	Seated valve
Version	▪ Manifold mounting ▪ Insert valve
Material	**Model BE:** ▪ Nominal size 32, 50, 75, 100: Steel **Housing BA:** ▪ Nominal size 32, 50: Aluminium ▪ Nominal size 75, 100: Steel
Installation position	As desired
Ports/connections	**050 design:** ▪ **A:** Suction port/tank connection ▪ **B:** Pressure connection ▪ **F:** Control port **060 design:** ▪ **A:** Pressure connection ▪ **B:** Suction port/tank connection ▪ **F:** Control port
Hydraulic fluid	Hydraulic fluid, according to DIN 51524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 10 - 600 mm²/s Optimal operating range: approx. 20 – 100 mm²/s Not suitable for water-based fluids and native oils (HETG). Not suitable for HETG such as rapeseed oil and water-glycol solutions, e.g. HFA and HFC.
Cleanliness level	**ISO 4406** 22/19/16
Temperatures	Ambient conditions: approx. -10 to +50°C, hydraulic fluid: -10 to +70°C, ensure the correct viscosity range. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

3.2 Pressure and flow rate

Operating pressure	p_{max} = 320 bar
Flow rate	see Chapter 3.4, "Characteristic lines"

Pilot pressure p_{St} (bar)

Type	Control pressure (bar)	
	p_1	p_2
NSV060B.03 NSV060B.03L	1.3	2.7
NSV060B.05 NSV060B.05L	1.0	3.1
NSV050B.07 NSV050B.07L	3.0	6.5
NSV060B.07 NSV060B.07L	1.1	2.4
NSV050B.10 NSV050B.10L	2.3	6.4
NSV060B.10 NSV060B.10L	0.5	1.4

NOTICE

The control pressures are calculated using nominal values, i.e. without tolerances, and must be regarded as guide values. Forces acting on the underside of the piston, as well as any frictional force from the piston seal, are not taken into account in these specifications.

- Control pressure p_1 is the minimum pressure that must be applied in control line F to move the piston. The pressure in control line F must be below control pressure p_1 during opening so that the valve reopens fully.
- Control pressure p_2 is the minimum pressure that must be applied in control line F to move the piston all the way to the seat.

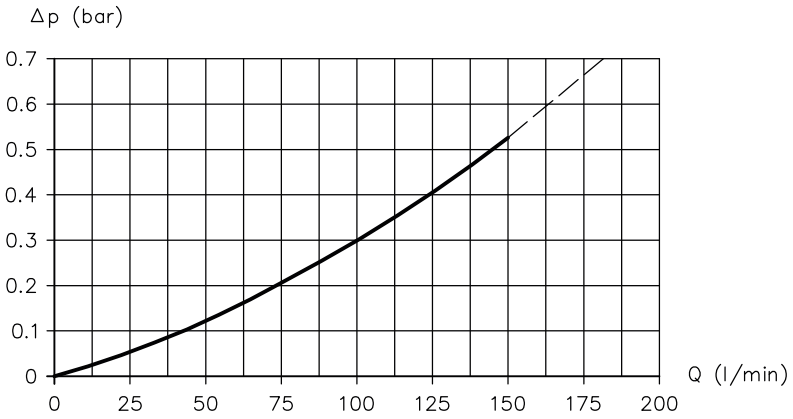
3.3 Weight

Model	BE	BA
Nominal size 32	= 1.1 kg	= 2.5 kg
Nominal size 50	= 3.7 kg	= 7.4 kg
Nominal size 75	= 13.6 kg	= 35.0 kg
Nominal size 100	= 22.2 kg	= 61.3 kg

3.4 Characteristic lines

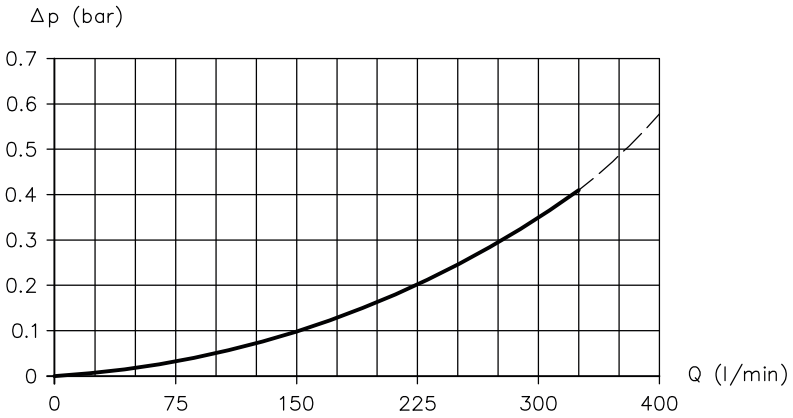
Measured at a hydraulic fluid temperature of +30 °C, viscosity of 75 mm²/s, ±5% tolerance

Nominal size 32



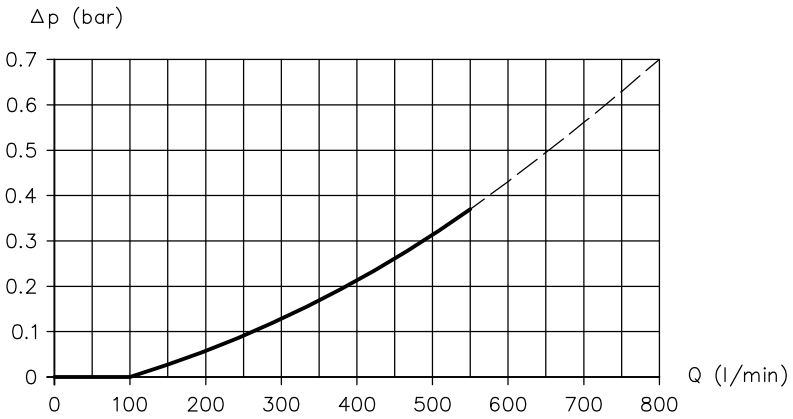
Q Flow rate (l/min); Δp Operating pressure (bar)

Nominal size 50



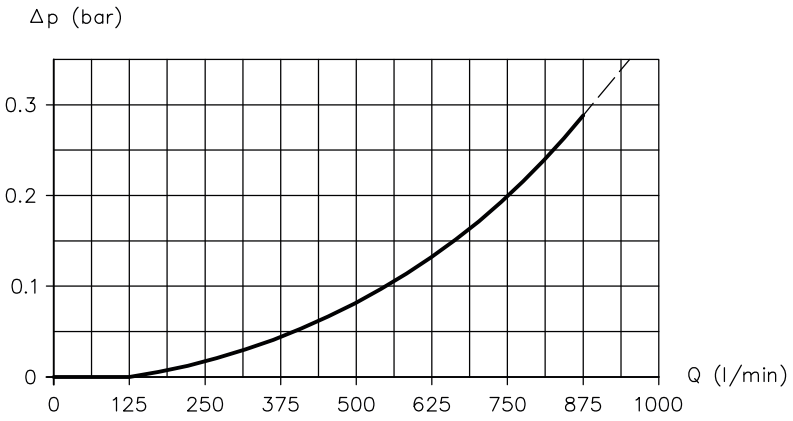
Q Flow rate (l/min); Δp Operating pressure (bar)

Nominal size 75



Q Flow rate (l/min); Δp Operating pressure (bar)

Nominal size 100



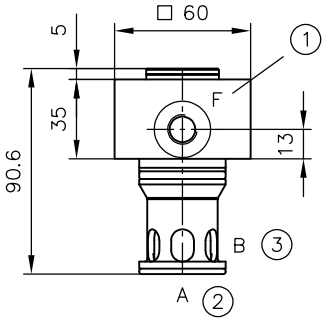
Q Flow rate (l/min); Δp Operating pressure (bar)

4 Dimensions

All dimensions in mm, subject to change.

Nominal size 32 - In-cylinder (BE)

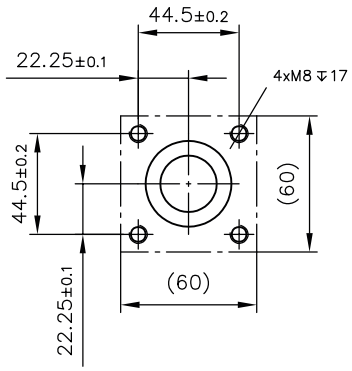
NSV..BE03



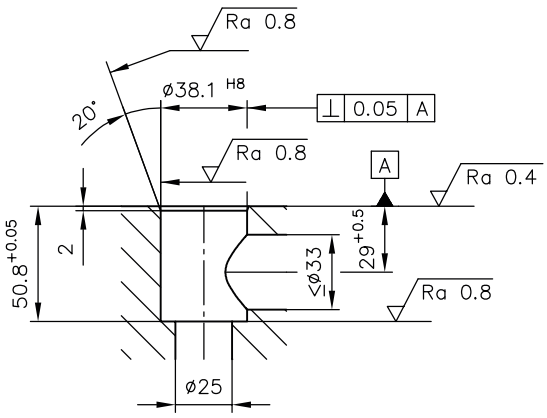
1 Control port F
2 Pressure connection A
3 Tank connection B

	Port (ISO 228-1)
F	G 1/4

Hole pattern



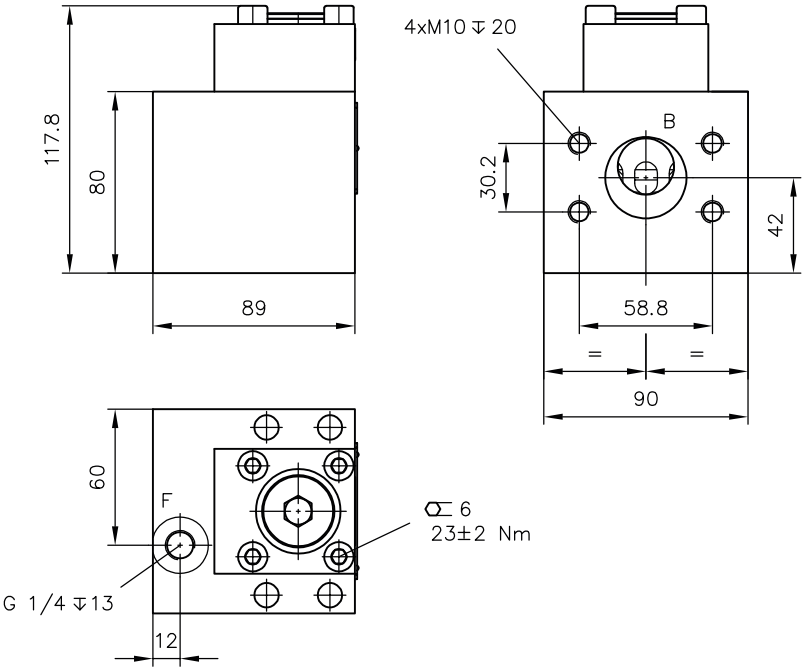
Mounting hole



Minimum screw length for fastening: 50 mm.
Screws of property class 10.9 (34^{+2} Nm) are recommended; others on request.

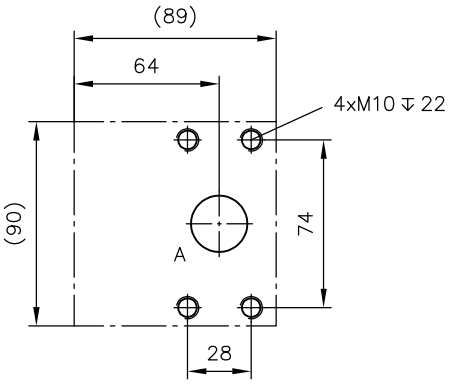
Nominal size 32 - On-cylinder (BA)

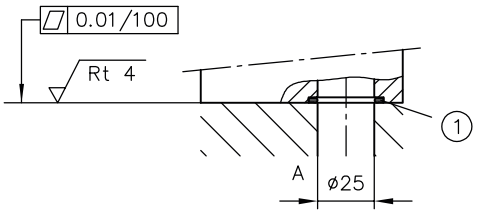
NSV..BA03



	Port (SAE J 514)
B	SAE 1 1/4"

Hole pattern of the base plate





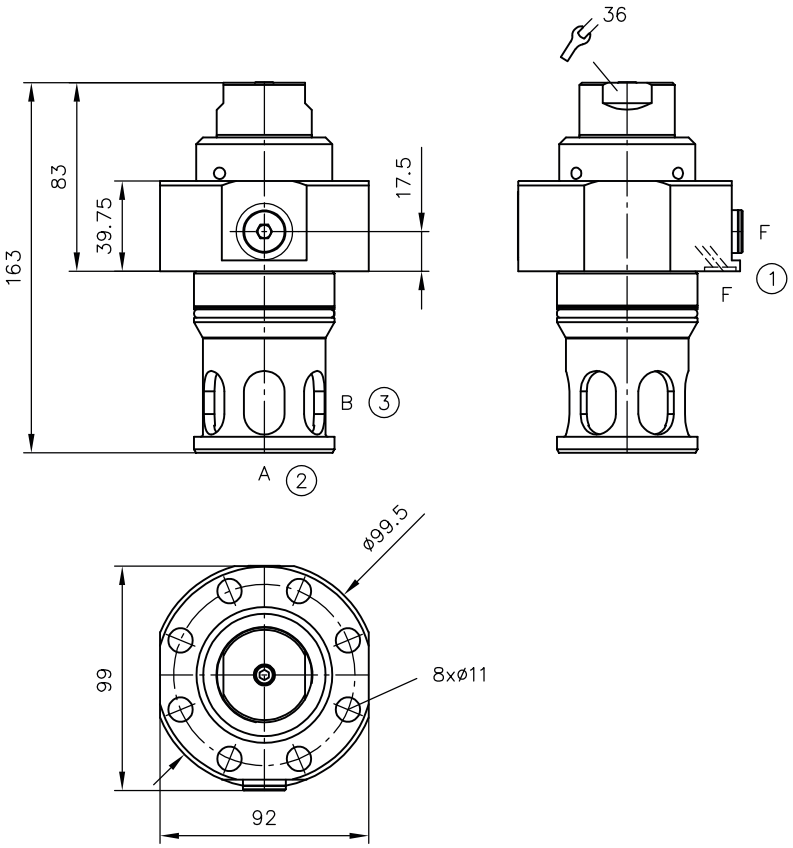
1 Flange seal 25x33x2.4 NBR 90 Sh

Minimum screw length for fastening: 100 mm.
Screws of property class 10.9 (68^{+2} Nm) are recommended; others on request.

The fastening screws are not included in the scope of delivery.

Nominal size 50 - In-cylinder (BE)

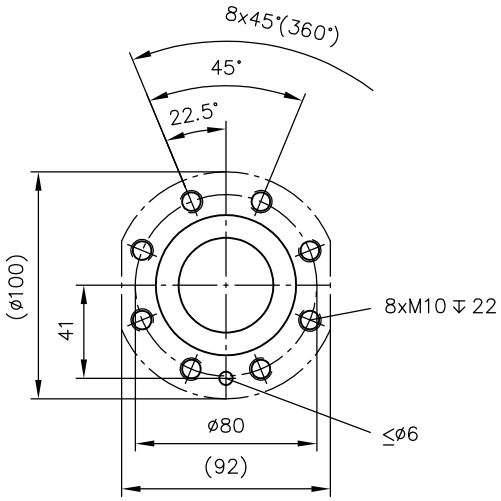
NSV..BE05



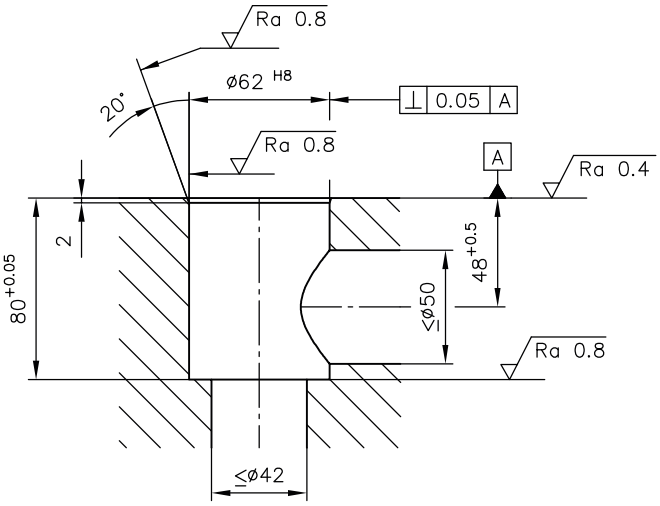
1 Control port F
2 Pressure connection A
3 Tank connection B

	Port (ISO 228-1)
F	G 1/4

Hole pattern



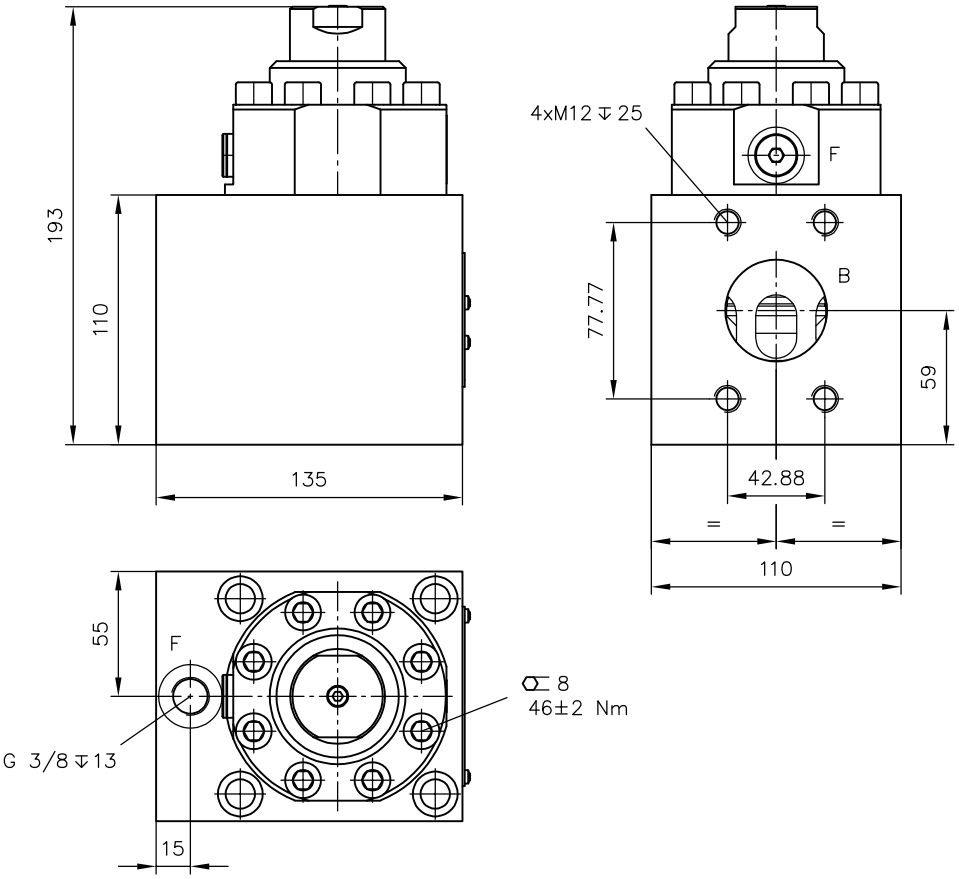
Mounting hole



Minimum screw length for fastening: 60 mm.
Screws of property class 10.9 (68^{+2} Nm) are recommended; others on request.

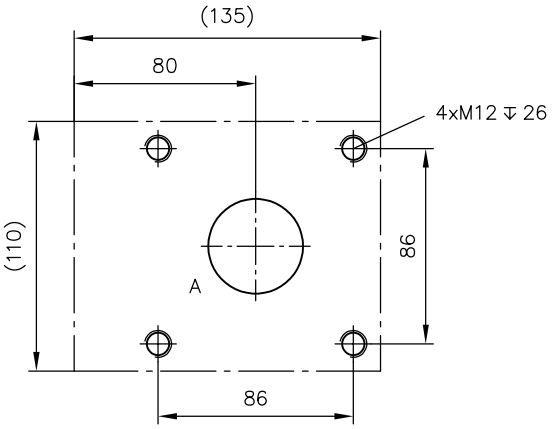
Nominal size 50 - On-cylinder (BA)

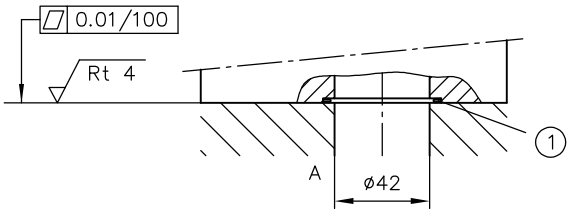
NSV..BA05



	Port (SAE J 514)
B	SAE 2"

Hole pattern of the base plate





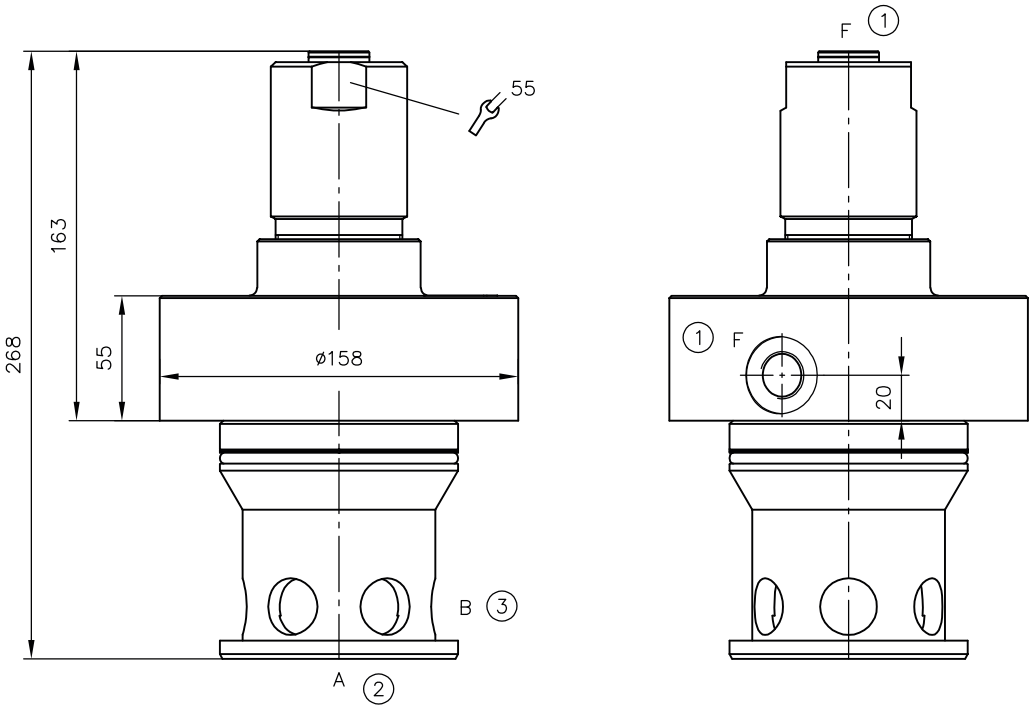
1 Flange seal 45x52x1.9 NBR 90

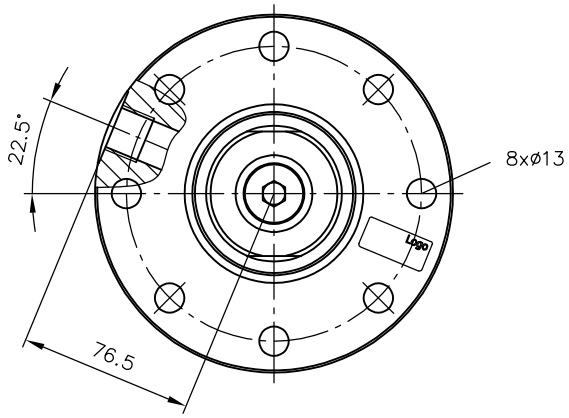
Minimum screw length for fastening: 120 mm.
Screws of property class 10.9 (110^{+2} Nm) are recommended; others on request.

The fastening screws are not included in the scope of delivery.

Nominal size 75 - In-cylinder (BE)

NSV..BE07

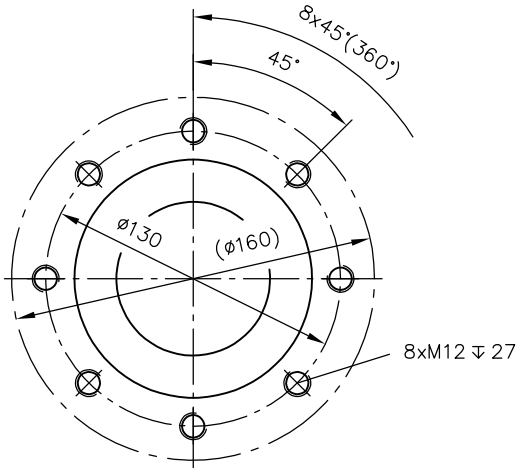




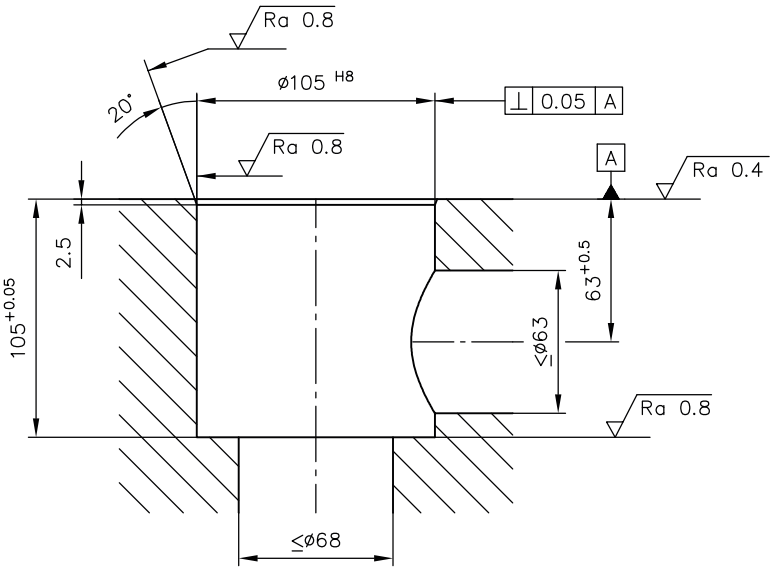
1 Control port F
2 Pressure connection A
3 Tank connection B

	Port (ISO 228-1)
F	G 1/2

Hole pattern



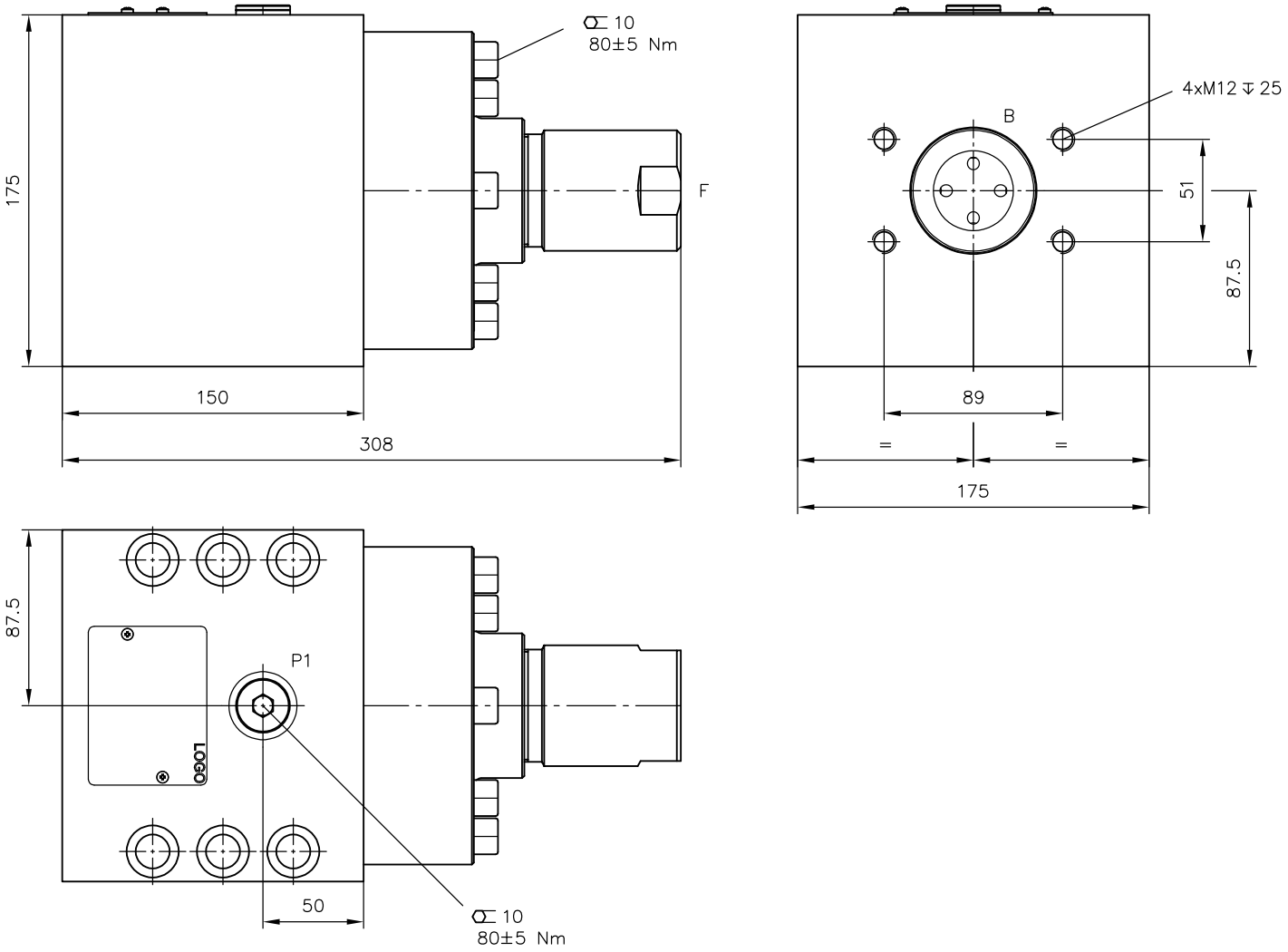
Mounting hole



Minimum screw length for fastening: 80 mm.
Screws of property class 10.9 (110^{+2} Nm) are recommended; others on request.

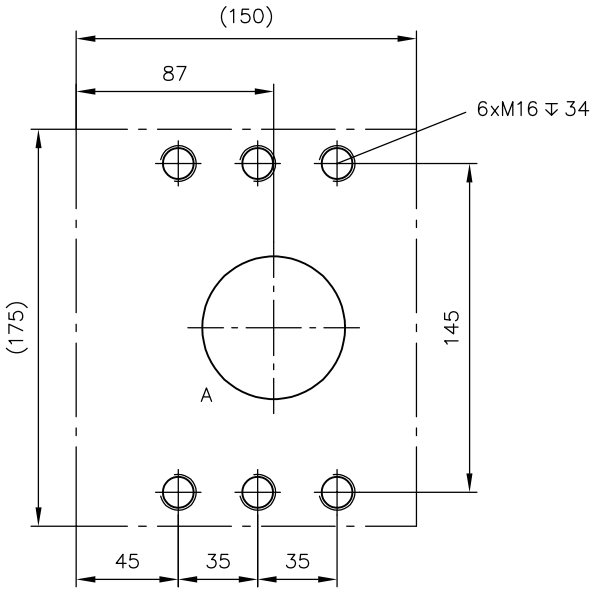
Nominal size 75 - On-cylinder (BA)

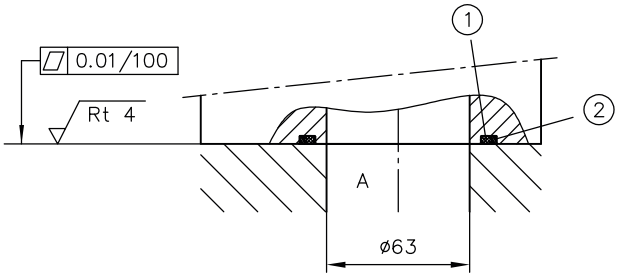
NSV..BA07



	Connections (ISO 228-1 or SAE J 514)
B	SAE 2 1/2"
P1	G 1/2

Hole pattern of the base plate





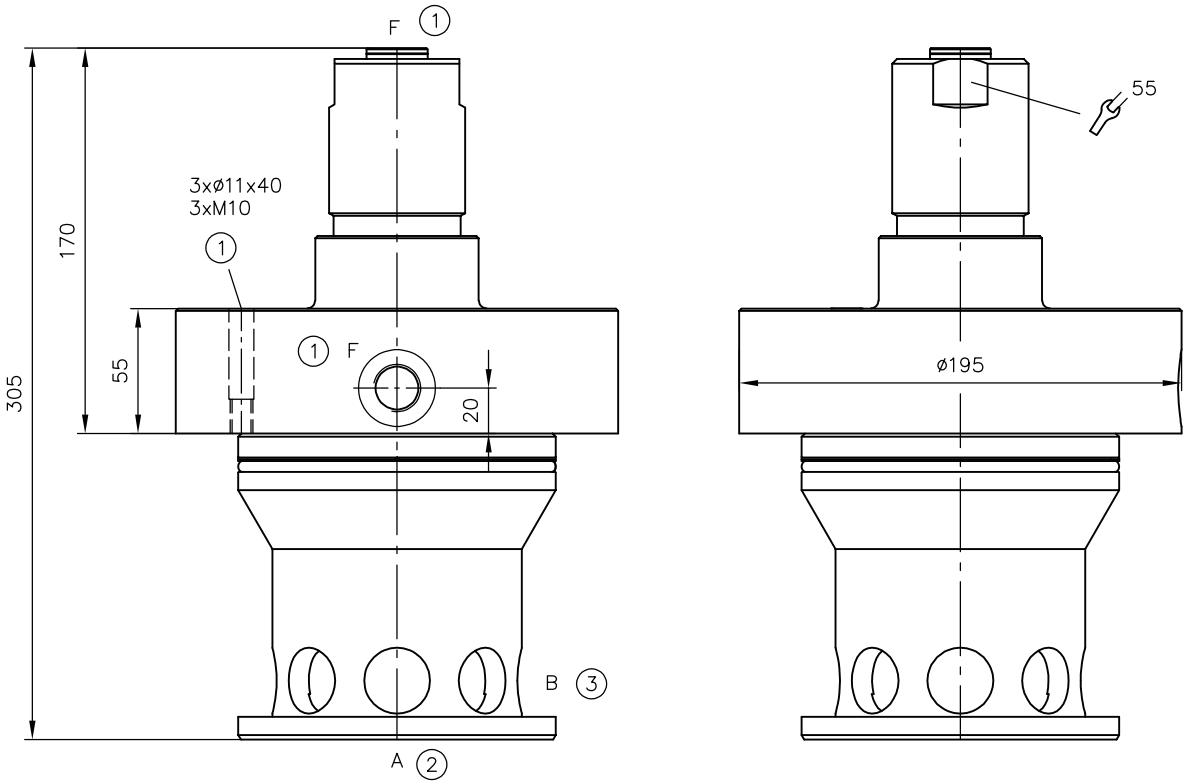
1 O-ring 76x4 NBR 90 Sh
2 Supporting ring 82.6x86.8x3.6

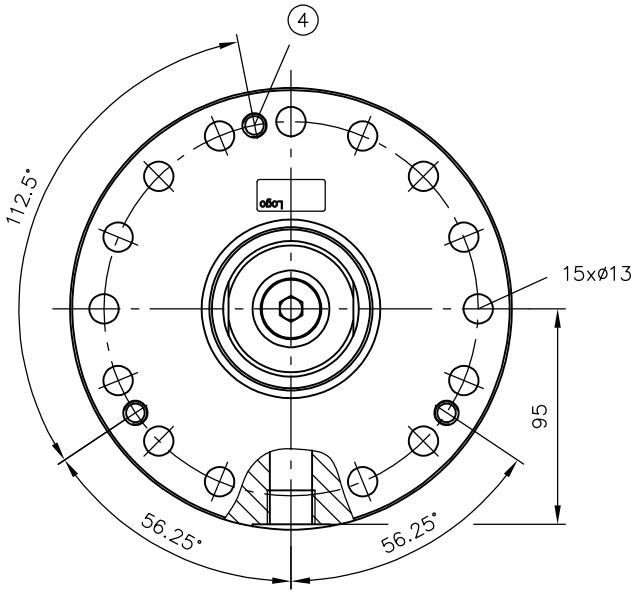
Minimum screw length for fastening: 110 mm.
Screws of property class 10.9 (270^{+2} Nm) are recommended; others on request.

The fastening screws are not included in the scope of delivery.

Nominal size 100 - In-cylinder (BE)

NSV..BE10

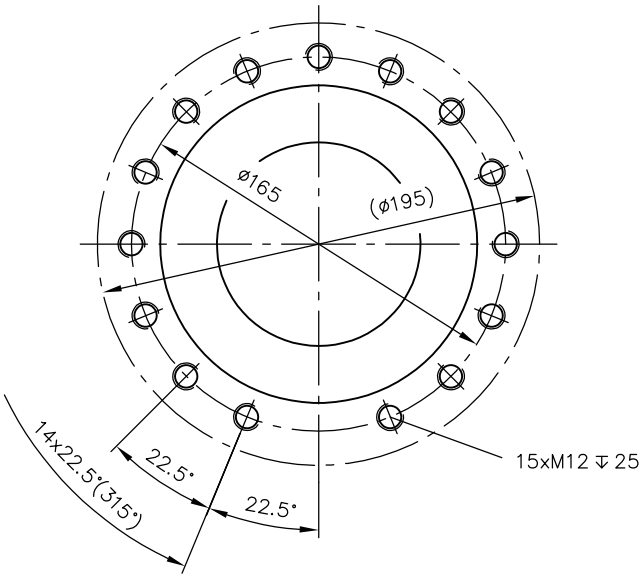




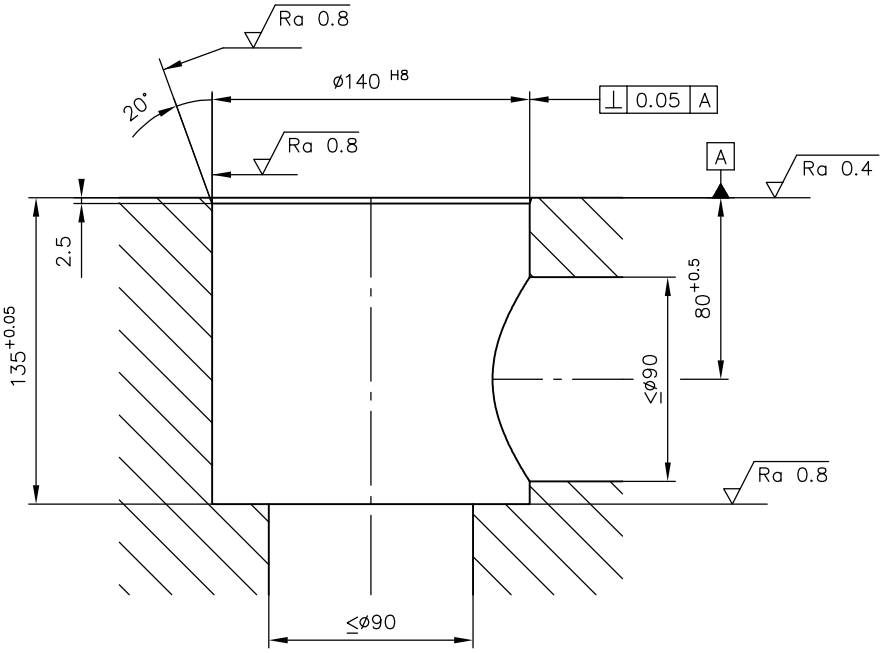
1 Control port F
2 Pressure connection A
3 Tank connection B
4 Thread for disassembly

	Port (ISO 228-1)
F	G 1/2

Hole pattern



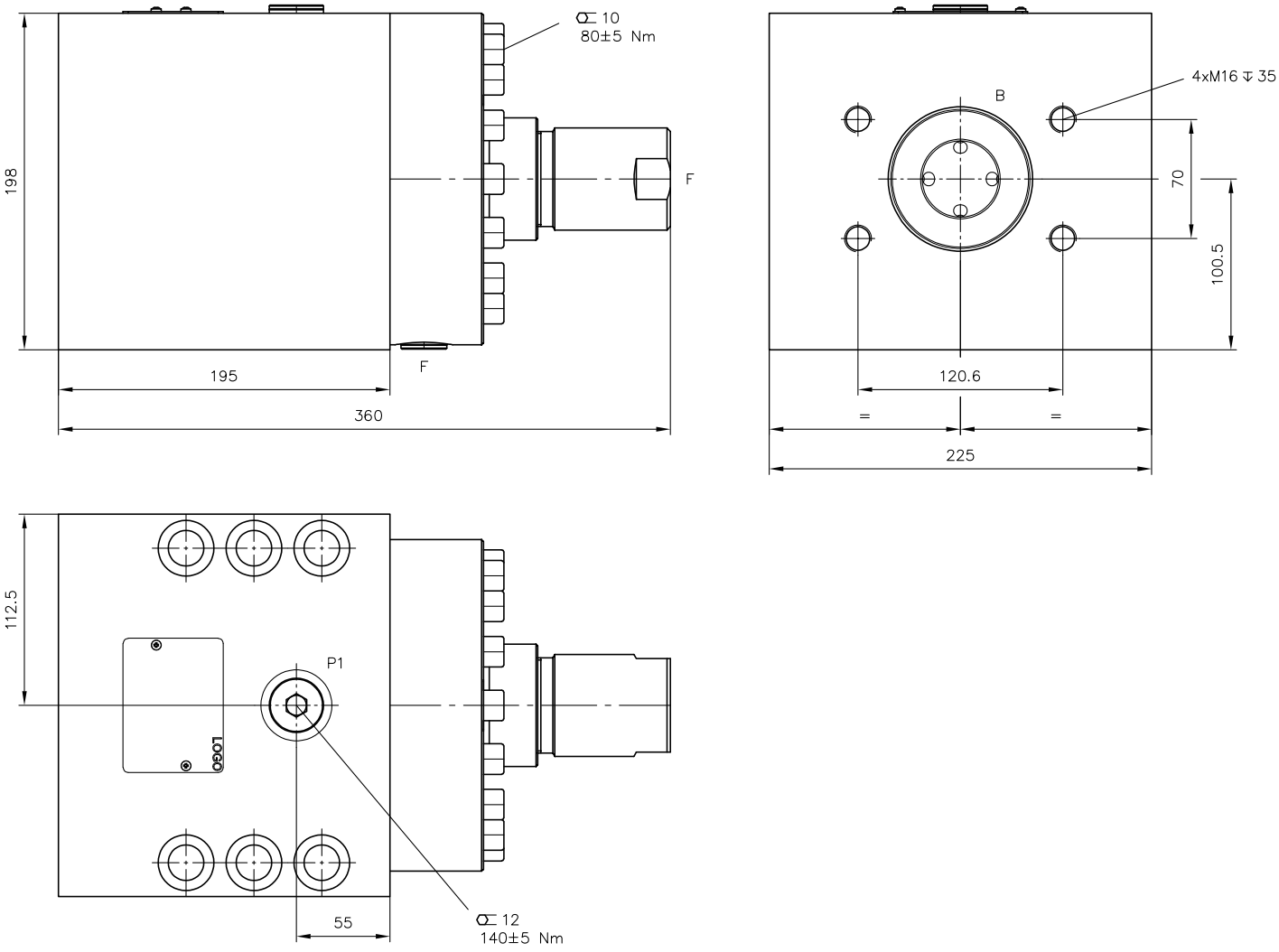
Mounting hole



Minimum screw length for fastening: 80 mm.
Screws of property class 10.9 (110^{+2} Nm) are recommended; others on request.

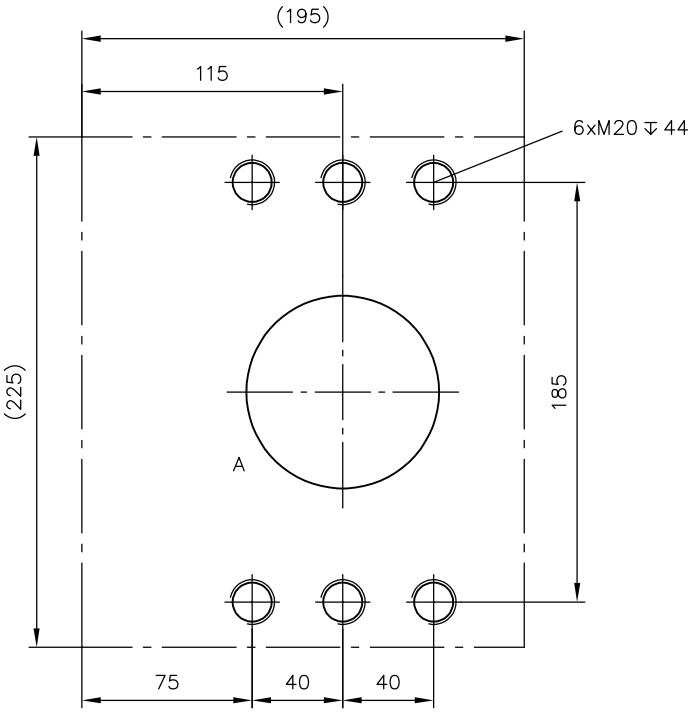
Nominal size 100 - On-cylinder (BA)

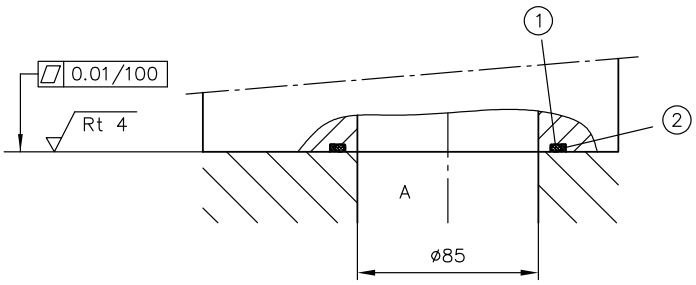
NSV..BA10



	Connections (ISO 228-1 or SAE J 514)
B	SAE 3 1/2"
P1	G 3/4

Hole pattern of the base plate





1 O-ring 100x4 NBR 90 Sh
2 Supporting ring 106.4x110x3.6

Minimum screw length for fastening: 130 mm.
Screws of property class 10.9 (540^{+2} Nm) are recommended; others on request

The fastening screws are not included in the scope of delivery.

5 Installation, operation and maintenance information

Observe the document B 5488 “General operating instructions for assembly, commissioning, and maintenance.”

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

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

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 specialist personnel.
- ► The product must only be operated within the specified technical parameters described in detail in this document.
- ► All components must be suitable for the operating conditions when using an assembly.
- ► The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. 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 and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

⚠ **DANGER**

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

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

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

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

NOTICE

- ► 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**

Overloading components due to incorrect pressure settings.

Minor injuries. Flyaway or bursting parts and uncontrolled leakage of hydraulic fluid.

- ▪ Pay attention to the maximum operating pressure of the pump, valves and fittings.
- ▪ 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 the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

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

NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ► Filter new hydraulic fluid to a high quality when filling.
- ► Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level see Chapter 3, "Parameters").

Additionally applicable document: D 5488/1 oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

6.1 Accessories, spare and individual parts

Seal kit

Order number	Coding
HEX0613A	SEAL KIT\ NSV06.BE03
HEX0558A	SEAL KIT\ NSV06.BE05.
HEX0563A	SEAL KIT\ NSV0..BE07.
HEX0564A	SEAL KIT\ NSV0..BE10.

References

Additional system components/accessories

- Control for CNC press brakes type SAKB: D 6335
- Control for CNC press brakes type SPVM: D 6338
- Recommendation for hydraulic fluid: D 5488/1
- General operating manual for the assembly, initial operation and maintenance of hydraulic components and systems: B 5488

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