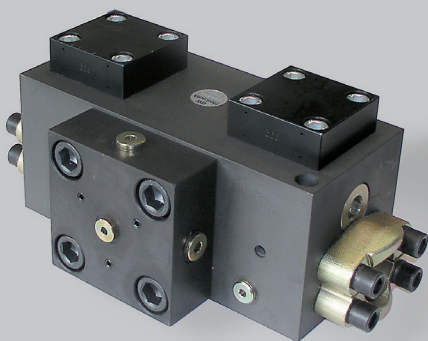


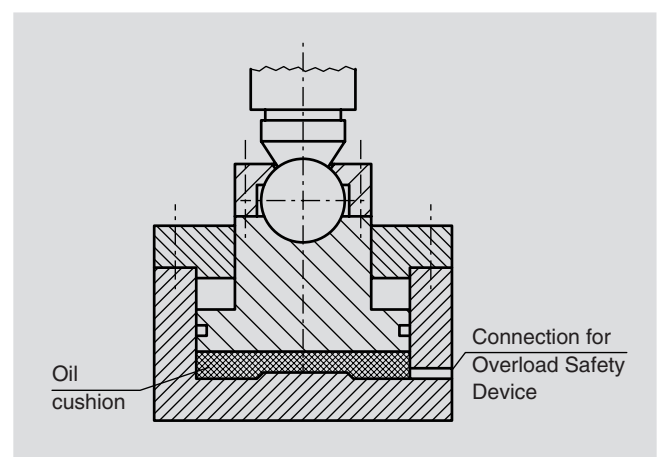
Voith Turbo

VOITH

Hydraulic Overload Safety Device for Mechanical Presses



A hydraulic cylinder is arranged in the flow of force of a mechanical press – typically, this will be between connecting rod and press ram. This hydraulic cylinder is pressurized to the working pressure required by means of a pressure generator. In the case of an overload, this cylinder is switched free of pressure. The press can end the stroke started without damage. In a press with multiple connecting rods, the corresponding number of hydraulic cylinders is arranged.



 **hydraulic**

Advantages

The working pressure is prepared in a particularly dynamic way thanks to the integration of the pilot valve in the central overload valve. Short reaction times

and reproducible behaviour with varying numbers of strokes and increases in force are the result.

- short reaction time thanks to direct-acting pressure processing
- high repeatability yielded by best dynamic switching
- hermetically dichtungendes system
- minimum pressure peaks, even at high speed
- adjustable pressing force
- large selection of area ratios

Technical Data

| General | | |
|---------------------|--------------------|--------------|
| Ambient temperature | °C | -20 to +50 |
| Mounting position | | any position |
| Seals | | Perbunan |
| Hydraulic | | |
| Switch of pressure | bar | max. 420 |
| Oil temperature | °C | -10 to +60 |
| Viscosity range | mm ² /s | 20 to 500 |

Function of hydraulic overload safety device with 2 connection rods

By means of a source of hydraulic compressed oil – for example, pneumo-hydraulic pressure intensifiers – both hydraulic cylinders are pressurized to the set point of the required operating pressure via the hydraulic overload safety device. Check valves prevent a flow back.

Both cylinders have the same pressure level.

Both cylinders are directly connected to the overload valve via a corresponding large check valve.

This overload valve is kept in the closed position by the operating pressure (pressure generator). In this situation, no compressed oil can flow off to the tank from the hydraulic cylinders. The valve control of the overload safety device works with a hermetically sealing effect.

As soon as the press works and forces are fed in via the connecting rods, the pressure in the hydraulic cylinder increases. The increase of pressure is system-induced and can vary in the cylinders – depending on the load.

If the cylinders are relieved again, the pressure returns to the set point. If the operating pressure drops below the set value, the corresponding correction is carried out via the pressure generator.

The difference between the set point pressure and the reaction pressure for the overload safety device is set by means of an area ratio in the central control valve. A variation in the set point pressure results in a corresponding variation of the reaction pressure. If this reaction pressure is reached in one or both the cylinders, the overload safety device starts to function.

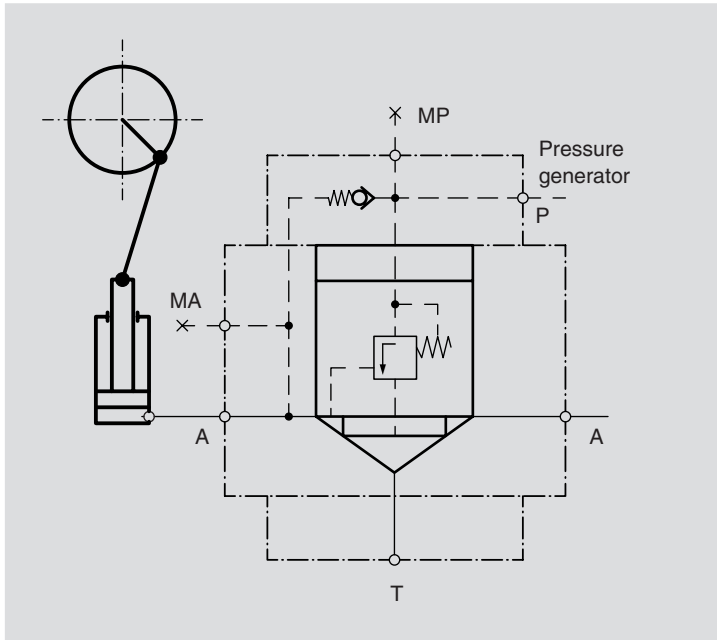
Both cylinders are opened towards the tank simultaneously thanks to a pressure-dependent opening of the central control valve. The pressure can relieve itself and the flow of oil resulting from the movement of the press can flow to the tank.

The press can end the stroke it has started without damage.

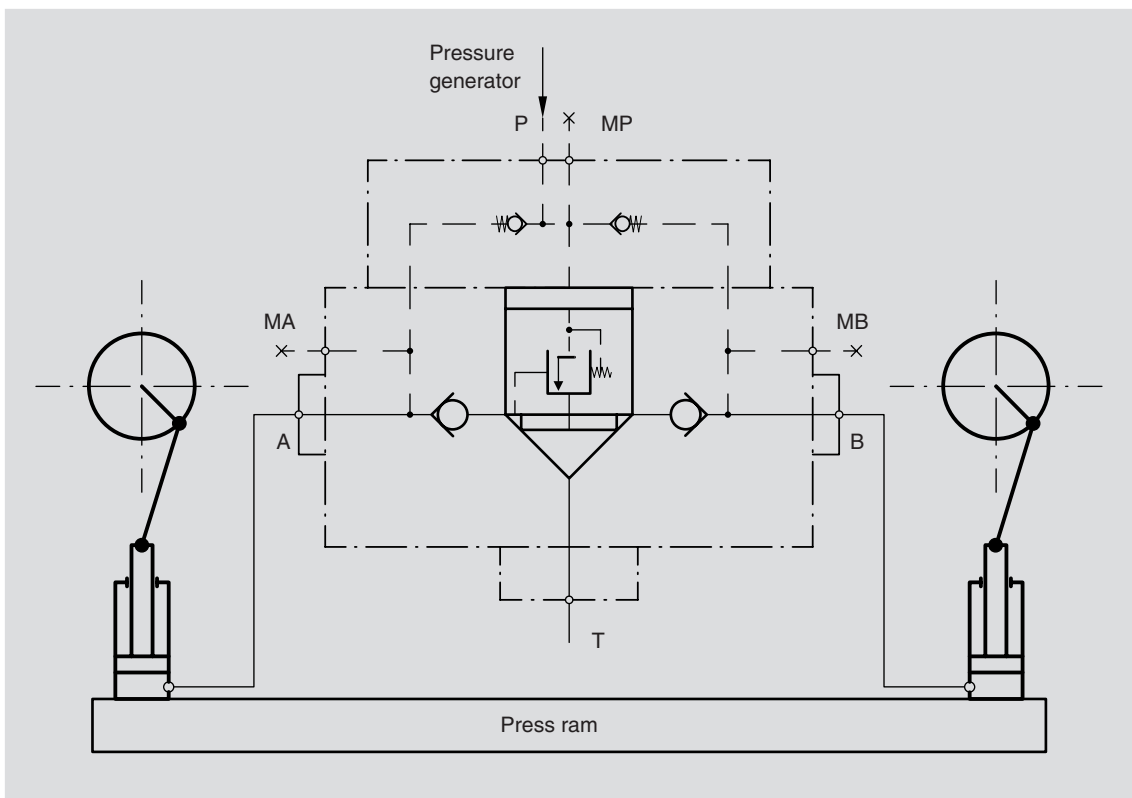
The reaction of the overload safety device is signalled via a pressure switch, with the result that no further stroke is initiated. Production with the press is only possible after the two hydraulic cylinders have been pre-stressed at operating pressure again.

Naturally, the hydraulic cylinders can be “released“ and the press “turned“ by purposeful switching off the operating pressure.

Hydraulic Circuit

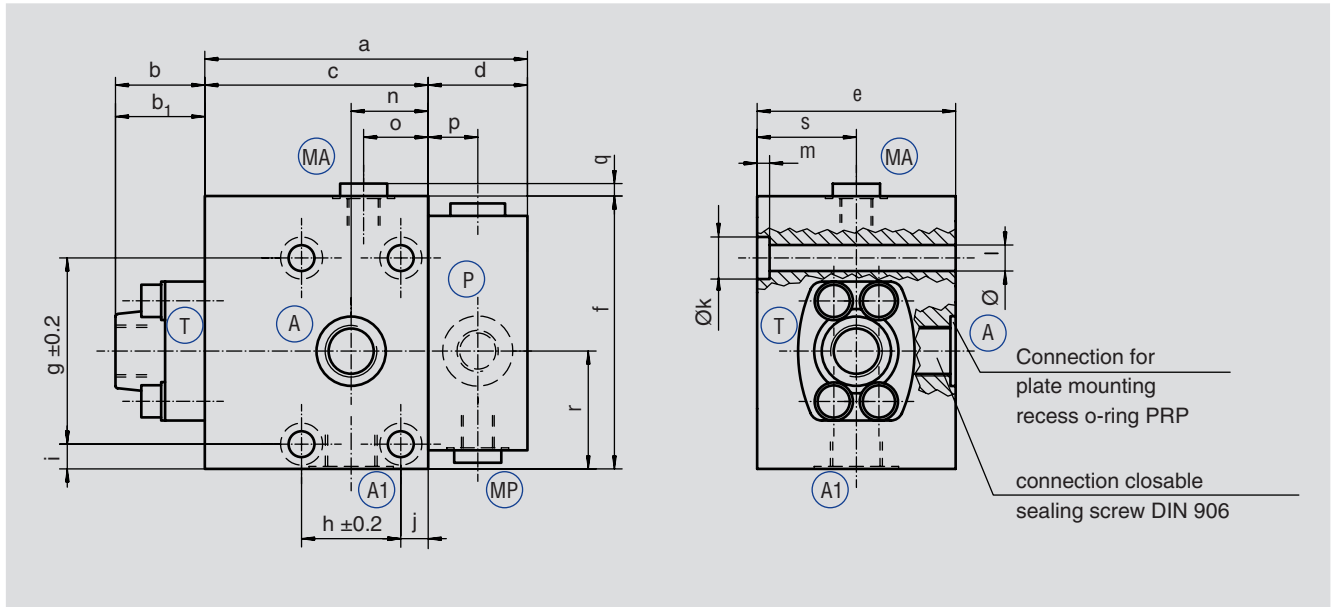


Function of the Overload Safety Device with the example of a mechanical press with one connecting rod



Function of the Overload Safety Device with the example of a mechanical press with two connecting rods

Dimensional drawing single point version, NG 16, NG 25, NG 40

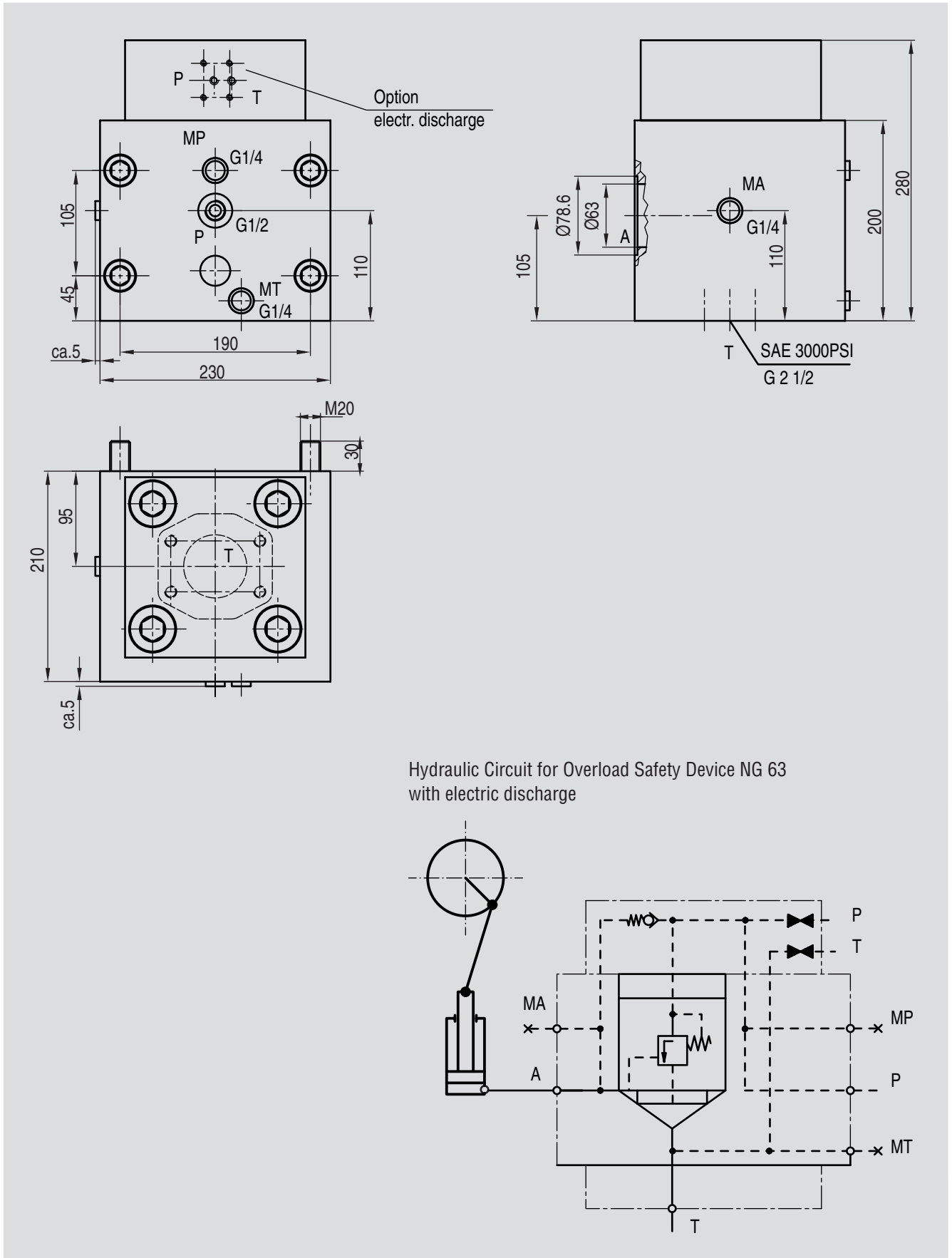


| Nominal size | P | T | A1 | A | | MP | MA |
|--------------|-------|-------|---------|---------|--------|----------------|-------|
| | | | | PRP | O-Ring | | |
| | | G/SAE | | | | | |
| 16 | G 3/8 | 1/2 | G 1/2 | G 1/2 | 119 | Ø23.47 x Ø2.62 | G 1/4 |
| 25 | G 3/8 | 1 | G 3/4 | G 3/4 | 123 | Ø29.82 x Ø2.62 | G 1/4 |
| 40 | G 3/8 | 1 1/2 | G 1 1/2 | G 1 1/4 | 225 | Ø47.22 x Ø3.53 | G 1/4 |

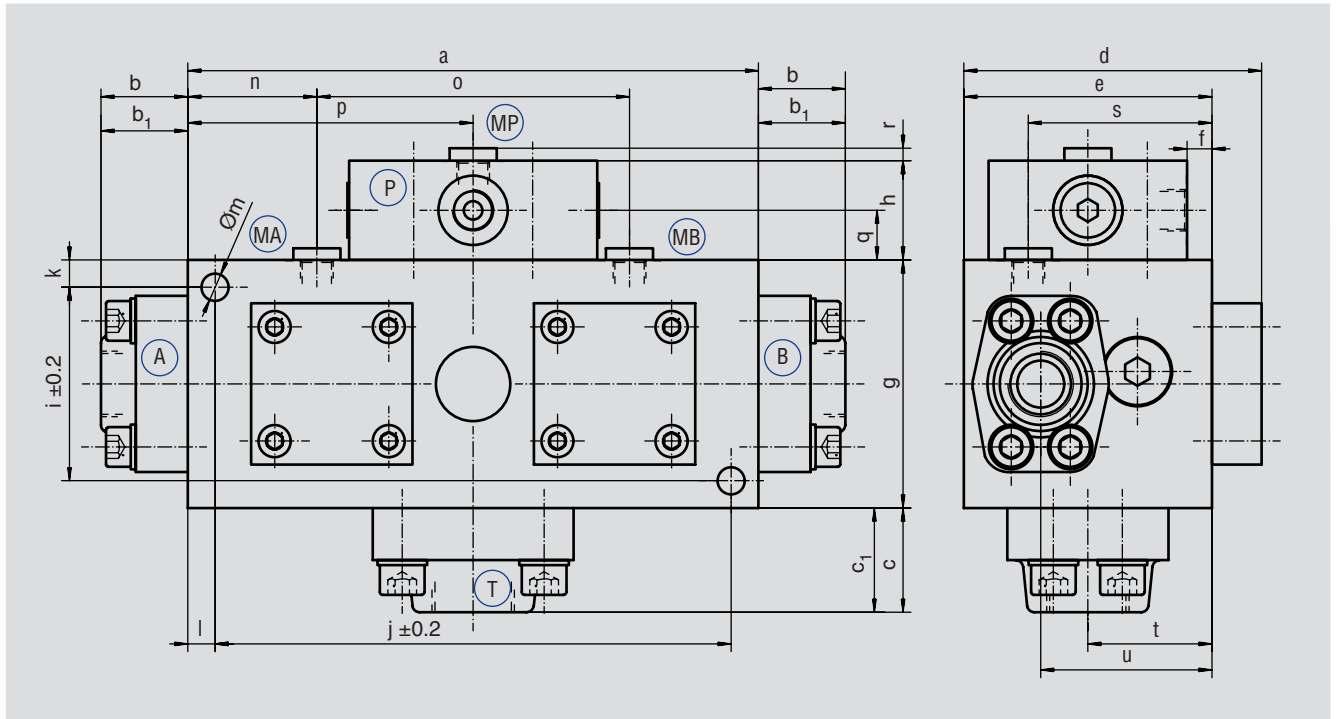
| Nominal size | a | b | b ₁ | c | d | e | f | g | h | i | j | k |
|--------------|-----|----|----------------|-----|----|-----|-----|-----|----|------|------|------|
| 16 | 130 | 36 | 22 | 90 | 40 | 80 | 110 | 75 | 40 | 10 | 11 | 17 |
| 25 | 130 | 42 | 33 | 90 | 40 | 86 | 115 | 90 | 60 | 12.5 | 12.5 | 18.5 |
| 40 | 185 | 50 | 43 | 135 | 50 | 130 | 165 | 135 | 90 | 15 | 17 | 26 |

| Nominal size | l | m | n | o | p | q | r | s |
|--------------|------|----|------|------|----|---|------|----|
| 16 | 10.5 | 5 | 31 | 31 | 20 | 5 | 47.5 | 40 |
| 25 | 12.5 | 8 | 42.5 | 42.5 | 20 | 5 | 57.5 | 43 |
| 40 | 17 | 10 | 62 | 59 | 25 | 5 | 82.5 | 65 |

Dimensional drawing single point version, NG 63



Dimensional drawing, double point version



| Nominal size | P | T | A | B | MP | MA | MB |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | | G/SAE | G/SAE | G/SAE | | | |
| 25 | G 3/8 | 1 | 3/4 | 3/4 | G 1/4 | G 1/4 | G 1/4 |
| 40 | G 3/8 | 1 1/2 | 1 1/4 | 1 1/4 | G 1/4 | G 1/4 | G 1/4 |

| Nominal size | a | b | b ₁ | c | c ₁ | d | e | f | g | h | i | j |
|--------------|-----|----|----------------|----|----------------|-----|-----|-----|-----|----|-----|-----|
| 25 | 230 | 35 | 28 | 42 | 33 | 120 | 100 | 10 | 100 | 40 | 78 | 208 |
| 40 | 290 | 45 | 38 | 50 | 43 | 160 | 130 | 2.5 | 130 | 50 | 102 | 262 |

| Nominal size | k | l | m | n | o | p | q | r | s | t | u |
|--------------|----|----|----|----|-----|-----|----|---|-----|----|----|
| 25 | 11 | 11 | 11 | 52 | 126 | 115 | 20 | 5 | 74 | 50 | 69 |
| 40 | 14 | 14 | 18 | 50 | 190 | 145 | 25 | 5 | 105 | 65 | 90 |

Order data, single point version

| Single point version | | | | | | | |
|----------------------|----|-------|---------------|---------------|--------------|---------------|--------|
| Order No. | NG | Ratio | Full flange T | Full flange A | Halfflange T | Half flange A | Weight |
| | | | | | | | kg |
| 31301-200.4 | 16 | 1:1.3 | G 1/2 | - | - | - | 7.6 |
| 31301-220.4 | 16 | 1:1.3 | - | - | G 1/2 | - | 7.6 |
| 31301-240.4 | 16 | 1:1.3 | - | - | - | - | 7.2 |
| 31304-200.4 | 16 | 1:1.6 | G 1/2 | - | - | - | 7.6 |
| 31304-220.4 | 16 | 1:1.6 | - | - | G 1/2 | - | 7.6 |
| 31304-240.4 | 16 | 1:1.6 | - | - | - | - | 7.2 |
| 31307-200.4 | 16 | 1:1.8 | G 1/2 | - | - | - | 7.6 |
| 31307-240.4 | 16 | 1:1.8 | - | - | - | - | 7.2 |
| 31311-200.4 | 16 | 1:1.1 | G 1/2 | - | - | - | 7.6 |
| 31311-240.4 | 16 | 1:1.1 | - | - | - | - | 7.2 |
| | | | | | | | |
| 31302-200.4 | 25 | 1:1,3 | G 1 | - | - | - | 8.9 |
| 31302-220.4 | 25 | 1:1.3 | - | - | G 1 | - | 8.6 |
| 31302-240.4 | 25 | 1:1.3 | - | - | - | - | 7.9 |
| 31305-200.4 | 25 | 1:1.6 | G 1 | - | - | - | 8.9 |
| 31305-220.4 | 25 | 1:1.6 | - | - | G 1 | - | 8.6 |
| 31305-240.4 | 25 | 1:1.6 | - | - | - | - | 7.9 |
| 31308-200.4 | 25 | 1:1.8 | G 1 | - | - | - | 8.9 |
| 31308-240.4 | 25 | 1:1.8 | - | - | - | - | 7.9 |
| 31312-200.4 | 25 | 1:1.1 | G 1 | - | - | - | 8.9 |
| 31312-240.4 | 25 | 1:1.1 | - | - | - | - | 7.9 |
| | | | | | | | |
| 31303-200.4 | 40 | 1:1.3 | G 1 1/2 | - | - | - | 24.4 |
| 31303-220.4 | 40 | 1:1.3 | - | - | G 1 1/2 | - | 23.9 |
| 31303-240.4 | 40 | 1:1.3 | - | - | - | - | 22.1 |
| 31306-200.4 | 40 | 1:1.6 | G 1 1/2 | - | - | - | 24.4 |
| 31306-220.4 | 40 | 1:1.6 | - | - | G 1 1/2 | - | 23.9 |
| 31306-240.4 | 40 | 1:1.6 | - | - | - | - | 22.1 |
| 31309-200.4 | 40 | 1:1.8 | G 1 1/2 | - | - | - | 24.4 |
| 31309-240.4 | 40 | 1:1.8 | - | - | - | - | 22.1 |
| 31313-200.4 | 40 | 1:1.1 | G 1 1/2 | - | - | - | 24.4 |
| 31313-240.4 | 40 | 1:1.1 | - | - | - | - | 22.1 |
| | | | | | | | |

Order Data, Double Point Version

| Double point version | | | | | | | |
|----------------------|----|-------|---------------|------------------|---------------|------------------|--------|
| Order No. | NG | Ratio | Full flange T | Full flange A; B | Half flange T | Half flange A; B | Weight |
| | | | | | | | kg |
| 31322-200.4 | 25 | 1:1.3 | G 1 | G 3/4 | - | - | 21.3 |
| 31322-220.4 | 25 | 1:1.3 | - | - | G 1 | G 3/4 | 20.6 |
| 31322-240.4 | 25 | 1:1.3 | - | - | - | - | 18.9 |
| 31325-200.4 | 25 | 1:1.6 | G 1 | G 3/4 | - | - | 21.3 |
| 31325-220.4 | 25 | 1:1.6 | - | - | G 1 | G 3/4 | 20.6 |
| 31325-240.4 | 25 | 1:1.6 | - | - | - | - | 18.9 |
| 31328-200.4 | 25 | 1:1.8 | G 1 | G 3/4 | - | - | 21.3 |
| 31328-240.4 | 25 | 1:1.8 | - | - | - | - | 18.9 |
| | | | | | | | |
| 31323-200.4 | 40 | 1:1.3 | G 1 1/2 | G 1 1/4 | - | - | 43.6 |
| 31323-220.4 | 40 | 1:1.3 | - | - | G 1 1/2 | G 1 1/4 | 42.1 |
| 31323-230.4 | 40 | 1:1.3 | - | - | - | G 1 1/4 | 40.3 |
| 31323-240.4 | 40 | 1:1.3 | - | - | - | - | 38.3 |
| 31324-200.4 | 40 | 1:1.1 | G 1 1/2 | G 1 1/4 | - | - | 43.6 |
| 31324-240.4 | 40 | 1:1.1 | - | - | - | - | 38.3 |
| 31326-200.4 | 40 | 1:1.6 | G 1 1/2 | G 1 1/4 | - | - | 43.6 |
| 31326-220.4 | 40 | 1:1.6 | - | - | G 1 1/2 | G 1 1/4 | 42.1 |
| 31326-230.4 | 40 | 1:1.6 | - | - | - | G 1 1/4 | 40.3 |
| 31326-240.4 | 40 | 1:1.6 | - | - | - | - | 38.3 |
| 31329-200.4 | 40 | 1:1.8 | G 1 1/2 | G 1 1/4 | - | - | 43.6 |
| 31329-220.4 | 40 | 1:1.8 | - | - | G 1 1/2 | G 1 1/4 | 42.1 |
| 31329-240.4 | 40 | 1:1.8 | - | - | - | - | 38.3 |
| | | | | | | | |

Further versions upon request

Voith Turbo H + L Hydraulic GmbH & Co. KG
Schuckertstraße 15
71277 Rutesheim, Germany
Tel. +49 7152 992-3
Fax +49 7152 992-400
sales-rut@voith.com
www.voithturbo.com/hydraulic-systems

VOITH
Engineered reliability.