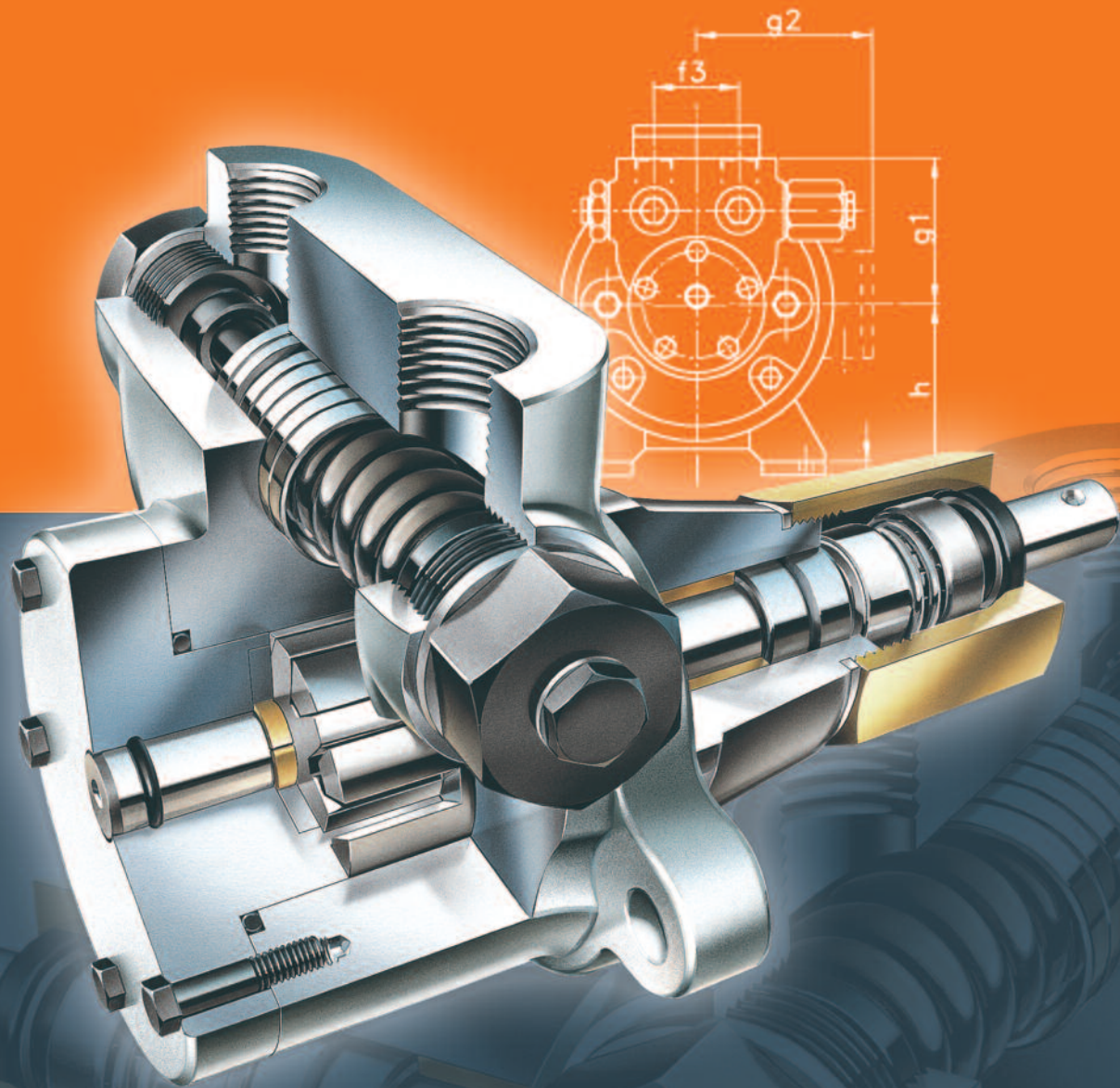


## Main Catalog



**hp-TECHNIK GmbH**

Gablonzer Str. 21

D-76185 Karlsruhe

Phone +49 (0) 721/956 18-0

Fax +49 (0) 721/956 18-28

E-Mail [info@hptechnik.com](mailto:info@hptechnik.com)**Sales**

Ms. Unger +49 (0) 721/956 18-33  
[unger@hptechnik.com](mailto:unger@hptechnik.com)

Ms. Wernthal +49 (0) 721/956 18-14  
[wernthal@hptechnik.com](mailto:wernthal@hptechnik.com)

Mr. Kretzler +49 (0) 721/956 18-18  
[kretzler@hptechnik.com](mailto:kretzler@hptechnik.com)

Fax Sales +49 (0) 721/956 18-28

**Support**

Mr. Pabst +49 (0) 721/956 18-23  
[pabst@hptechnik.com](mailto:pabst@hptechnik.com)

Mr. Rau +49 (0) 721/956 18-25  
[rau@hptechnik.com](mailto:rau@hptechnik.com)

Fax Support +49 (0) 721/956 18-31



|          |                                                 |                  |
|----------|-------------------------------------------------|------------------|
| <b>1</b> | <b>Industrial pumps and special pumps</b>       | <b>4 - 21</b>    |
| <b>2</b> | <b>Overflow valves</b>                          | <b>22 - 31</b>   |
| <b>3</b> | <b>Motor pump program and motor pump groups</b> | <b>33 - 49</b>   |
| <b>4</b> | <b>Aggregates for single-pipe installation</b>  | <b>50 - 53</b>   |
| <b>5</b> | <b>Feed pumps and delivery aggregates</b>       | <b>54 - 65</b>   |
| <b>6</b> | <b>Accessories and spare parts</b>              | <b>66 - 68</b>   |
| <b>7</b> | <b>Oil burner nozzles</b>                       | <b>69</b>        |
| <b>8</b> | <b>Special aggregates<br/>Terms of sale</b>     | <b>70<br/>71</b> |



## Industrial pump program

1.0

**A total of 6 series of hp-Industrial pumps and hp-Special pumps are available.**

*An internal gear rotor drives an eccentric, externally toothed gear.*

*The rotor and the toothed wheel are sealed with a fixed crescent.*

*Internal gear pumps have been in use for more than 40 years and are used in many areas of industry because of their favorable construction and design.*



Series B



Series VB with overflow valve



Series VBR with overflow valve and bypass

### Technical facts:

- Discharge range: 45 bis 6000 l/h
- Operating pressures: 0 – 40 bar
- Temperatures: up to 150° C



Series NV with overflow valve and bypass



Series PON with overflow valve, bypass and integrated filter



Series UHE with overflow valve and bypass

### **Applications:**

#### **Oil burning systems**

As oil burner pumps, closed circular pipe and transfer pumps for all fuel oils EL, L, M, S, ES, coaltar oils, lignite tar, oils, kerosene.

#### **Machine construction**

As hydraulic pumps in hydraulic control units, as lubricating pumps for lubricating oils and greases, as cooling water pumps for water-oil emulsions.

#### **Mineral oil industry**

As feed pumps for oils, grease, tar and bitumen.

#### **NEW Ship building**

As lubricating oil pumps and booster pumps for lubricating, diesel and heavy oils. Certificate for marine available on request.

### **Material:**

Pump castings are made of hydraulic cast iron GG 25 (for UHE GGG 40); rotor is of C 60; pinion is of 16 Mn Cr 5; axial face seal of cast iron / coal; up to 150°C viton.

### **Advantages:**

Self-priming, self-lubricating, practically non-pulsating, quiet-running, practically maintenance-free, pressure proof and vacuum-tight shaft seals.

**In addition to the applications and pumping mediums mentioned here, hp-Industrial pumps are used in many other industries – pumping a wide variety of different mediums.**

## Key for hp-Special pumps up to 40 bar

1.0

for determination of the order numbers:

| Series |      |       |       | Discharge l/h<br>1400 min <sup>-1</sup><br>0 bar |      |    |      | - Direction of rotation<br>- Nozzle port (only PON)<br>viewed from shaft |                                    |                            |                           | Pressure<br>stage<br>bar                |                                                            | Speed of rotation                       |  | Medium |  | Special execution,<br>accessories (add code letters<br>consecutively) |  |
|--------|------|-------|-------|--------------------------------------------------|------|----|------|--------------------------------------------------------------------------|------------------------------------|----------------------------|---------------------------|-----------------------------------------|------------------------------------------------------------|-----------------------------------------|--|--------|--|-----------------------------------------------------------------------|--|
| B      | VB   | VBR   | NVBR  | P                                                | 45   | P  | 90   | D = clockwise rotation                                                   | 1 = 1 - 4                          | 0 = 0,5 - 1,5              | 9 = 950 min <sup>-1</sup> | 0 = fuel oil<br>MGO/MDO                 | H1 = electric heating<br>for series B, VB,<br>VBR and NVBR |                                         |  |        |  |                                                                       |  |
| B      | VB   | VBR   | NVBR  | M                                                | 80   | M  | 160  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| B      | VB   | VBR   | NVBR  | G                                                | 120  | G  | 240  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| B      | VB   | VBR   | NVBR  | F                                                | 160  | F  | 320  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | PP                                               | 150  | PP | 300  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | PZ                                               | 200  | PZ | 400  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | P                                                | 300  | P  | 600  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | MZ                                               | -    | MZ | 850  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | M                                                | 450  | M  | 900  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | GZ                                               | -    | GZ | 1100 |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BG     | VBG  | VBGR  | NVBGR | G                                                | 600  | G  | 1200 |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BH     | VBH  | VBHR  | NVBHR | P                                                | 1000 | -  | -    | I = counter<br>clockwise rotation                                        | 2 = 2 - 9                          | 1 = 1400 min <sup>-1</sup> | 5 = heavy fuel            | BH1 = drilling for H1                   |                                                            |                                         |  |        |  |                                                                       |  |
| BH     | VBH  | VBHR  | NVBHR | M                                                | 1500 | -  | -    |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BH     | VBH  | VBHR  | NVBHR | G                                                | 2000 | -  | -    |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BHG    | VBHG | VBHGR | -     | P                                                | 3000 | -  | -    | 3 = 6 - 25                                                               | 4 = 15 - 40                        | 2 = 2800 min <sup>-1</sup> |                           | H2 = electric heating<br>for series UHE |                                                            |                                         |  |        |  |                                                                       |  |
| BHG    | VBHG | VBHGR | -     | PZ                                               | 3700 | -  | -    |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BHG    | VBHG | VBHGR | -     | M                                                | 4500 | -  | -    |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| BHG    | VBHG | VBHGR | -     | G                                                | 6000 | -  | -    |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
|        |      |       |       |                                                  |      |    |      | L = nozzle port<br>left-hand side                                        | R = nozzle port<br>right-hand side |                            |                           |                                         |                                                            | H3 = electric heating<br>(only for PON) |  |        |  |                                                                       |  |
| UHE-A2 | -    | -     | -     | PZ                                               | 200  | PZ | 500  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| UHE-A3 | -    | -     | -     | P                                                | 300  | P  | 700  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| UHE-A4 | -    | -     | -     | M                                                | 450  | M  | 900  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| UHE-A5 | -    | -     | -     | GZ                                               | 550  | GZ | 1300 |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| PON    | -    | -     | -     | -                                                | -    | 3  | 90   |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| PON    | -    | -     | -     | -                                                | -    | 4  | 160  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| PON    | -    | -     | -     | -                                                | -    | 6  | 240  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |
| PON    | -    | -     | -     | -                                                | -    | 7  | 320  |                                                                          |                                    |                            |                           |                                         |                                                            |                                         |  |        |  |                                                                       |  |

**Example for ordering:** hp-Internal gear pump, series VB, with capacity of 450 l/h at 1400 min<sup>-1</sup>, fuel oil, direction of rotation „counterclockwise“, pressure settings 4 (15-40 bar).

### Series expression: VB GM – I – 4 – 10

max. permitted suction pressure on suction connection of the pump is -0,6 bar.

**Caution!** Gas secretions arise already at -0,4 bar.

### Conversion table

| Suntec |   | hp-TECHNIK  |             |
|--------|---|-------------|-------------|
| Suntec |   | hp-TECHNIK  |             |
|        |   | PON3-D      | PON3-I      |
| E4/J4  | ⇒ | PON4-D      | PON4-I      |
| E6/J6  | ⇒ | PON6-D      | PON6-I      |
| E7/J7  | ⇒ | PON7-D      | PON7-I      |
| TA 2 A | ⇒ | UHE-A2-PZ-D | UHE-A2-PZ-I |
| TA 3 A | ⇒ | UHE-A3-P-D  | UHE-A3-P-I  |
| TA 4 A | ⇒ | UHE-A4-M-D  | UHE-A4-M-I  |
| TA 5 A | ⇒ | UHE-A5-GZ-D | UHE-A5-GZ-I |

## Series B; without overflow valve

1.1

### Technical selection chart: scaled drawings

Direction of rotation viewed from shaft  
**I** = indirect – counterclockwise  
**D** = direct – clockwise

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation as per the size chart/sheet when ordering!



### hp-Internal gear pumps up to 40 bar (direction **I** = indirect – counterclockwise)

| Pump series<br>B | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> bei 20 °C |          |           |           |                                             |          |           |           | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection for (S/A) | Manometer connection | max. allowed pump RPM (min <sup>-1</sup> ) | Net weight (kg) |
|------------------|----------------------------------------------------------|----------|-----------|-----------|---------------------------------------------|----------|-----------|-----------|----------------------|------------|-------------------------------|----------------------|--------------------------------------------|-----------------|
|                  | n = 1400 min <sup>-1</sup><br>Discharge l/h              |          |           |           | n = 2800 min <sup>-1</sup><br>Discharge l/h |          |           |           |                      |            |                               |                      |                                            |                 |
|                  | Size:                                                    | at 9 bar | at 30 bar | at 40 bar | Article-no. I                               | at 9 bar | at 30 bar | at 40 bar |                      |            |                               |                      |                                            |                 |
| BP               | 45                                                       | 30       | 20        | 011/0002  | 90                                          | 60       | 50        | 013/0002  | 25                   | 12         | 3/8"                          | -                    | 2800                                       | 1,8             |
| BM               | 80                                                       | 60       | 50        | 011/0003  | 160                                         | 130      | 120       | 013/0003  | 25                   | 12         | 3/8"                          | -                    | 2800                                       | 1,8             |
| BG               | 120                                                      | 100      | 80        | 011/0004  | 240                                         | 200      | 190       | 013/0004  | 25                   | 12         | 3/8"                          | -                    | 2800                                       | 1,8             |
| BF               | 160                                                      | 140      | 120       | 011/0005  | 320                                         | 270      | 260       | 013/0005  | 25                   | 12         | 3/8"                          | -                    | 2800                                       | 1,8             |
|                  |                                                          |          |           |           |                                             |          |           |           |                      |            |                               |                      |                                            |                 |
| BG PP            | 150                                                      | 100      | 80        | 011/0052  | 300                                         | 240      | 210       | 013/0052  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG PZ            | 200                                                      | 160      | 140       | 011/0053  | 400                                         | 310      | 280       | 013/0053  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG P             | 300                                                      | 240      | 200       | 011/0019  | 600                                         | 520      | 480       | 013/0019  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG MZ            | -                                                        | -        | -         | -         | 850                                         | 750      | 700       | 013/0068  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG M             | 450                                                      | 390      | 360       | 011/0020  | 900                                         | 850      | 730       | 013/0020  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG GZ            | -                                                        | -        | -         | -         | 1100                                        | 1000     | 870       | 013/0054  | 38                   | 12         | 1/2"                          | -                    | 2800                                       | 2,6             |
| BG G             | 600                                                      | 540      | 480       | 011/0021  | 1200                                        | 1080     | 960       | 013/0031  | 38                   | 12         | 1/2"                          | -                    | 1680                                       | 2,6             |
|                  |                                                          |          |           |           |                                             |          |           |           |                      |            |                               |                      |                                            |                 |
| BH P             | 1000                                                     | 700      | 600       | 011/0031  | -                                           | -        | -         | -         | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 6,4             |
| BH M             | 1500                                                     | 1200     | 1000      | 011/0032  | -                                           | -        | -         | -         | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 6,4             |
| BH G             | 2000                                                     | 1700     | 1400      | 011/0033  | -                                           | -        | -         | -         | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 6,4             |
|                  |                                                          |          |           |           |                                             |          |           |           |                      |            |                               |                      |                                            |                 |
| BHG P            | 3000                                                     | 2200     | 2000      | 011/0043  | -                                           | -        | -         | -         | 75                   | 22         | 1 1/2"                        | -                    | 1400                                       | 14,9            |
| BHG PZ           | 3700                                                     | 3000     | 2700      | 011/0080  | -                                           | -        | -         | -         | 75                   | 22         | 1 1/2"                        | -                    | 1400                                       | 14,9            |
| BHG M            | 4500                                                     | 3600     | 3200      | 011/0044  | -                                           | -        | -         | -         | 75                   | 22         | 1 1/2"                        | -                    | 1400                                       | 14,9            |
| BHG G            | 6000                                                     | 4800     | -         | 011/0045  | -                                           | -        | -         | -         | 75                   | 22         | 1 1/2"                        | -                    | 1400                                       | 14,9            |

### hp-Internal gear pumps up to 40 bar (direction **D** = direct – clockwise)

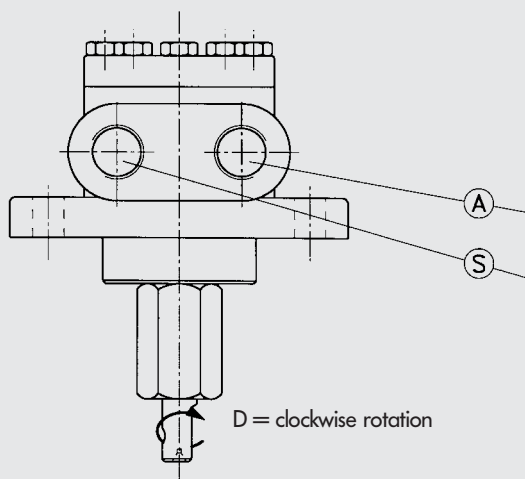
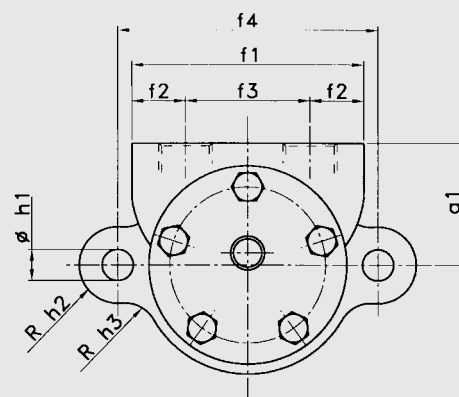
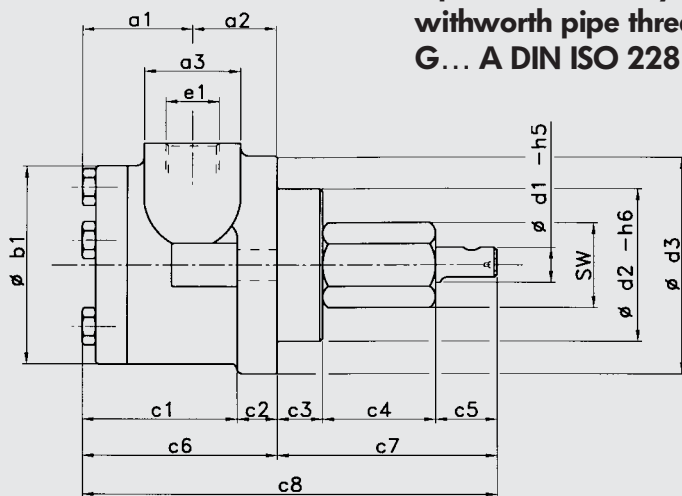
| Pump series B | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> bei 20 °C |          |           |           |                                             |          |           |           | Gear rotor |    | Threaded connection for (S/A) | Manometer connection | Heating capacity H1 in watt at 220V, 50HZ at 1/D | Initial pump breakaway torque at 1/D |
|---------------|----------------------------------------------------------|----------|-----------|-----------|---------------------------------------------|----------|-----------|-----------|------------|----|-------------------------------|----------------------|--------------------------------------------------|--------------------------------------|
|               | n = 1400 min <sup>-1</sup><br>Discharge l/h              |          |           |           | n = 2800 min <sup>-1</sup><br>Discharge l/h |          |           |           |            |    |                               |                      |                                                  |                                      |
|               | Size:                                                    | at 9 bar | at 30 bar | at 40 bar | Article-no. D                               | at 9 bar | at 30 bar | at 40 bar |            |    |                               |                      |                                                  |                                      |
| BP            | 45                                                       | 30       | 20        | 012/0002  | 90                                          | 60       | 50        | 014/0002  | 25         | 12 | 3/8"                          | -                    | 100                                              | 1,2                                  |
| BM            | 80                                                       | 60       | 50        | 012/0003  | 160                                         | 130      | 120       | 014/0003  | 25         | 12 | 3/8"                          | -                    | 100                                              | 1,2                                  |
| BG            | 120                                                      | 100      | 80        | 012/0004  | 240                                         | 200      | 190       | 014/0004  | 25         | 12 | 3/8"                          | -                    | 100                                              | 1,2                                  |
| BF            | 160                                                      | 140      | 120       | 012/0005  | 320                                         | 270      | 260       | 014/0005  | 25         | 12 | 3/8"                          | -                    | 100                                              | 1,2                                  |
|               |                                                          |          |           |           |                                             |          |           |           |            |    |                               |                      |                                                  |                                      |
| BG PP         | 150                                                      | 100      | 80        | 012/0052  | 300                                         | 240      | 210       | 014/0052  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG PZ         | 200                                                      | 160      | 140       | 012/0053  | 400                                         | 310      | 280       | 014/0053  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG P          | 300                                                      | 240      | 200       | 012/0019  | 600                                         | 520      | 480       | 014/0019  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG MZ         | -                                                        | -        | -         | -         | 850                                         | 750      | 700       | 014/0068  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG M          | 450                                                      | 390      | 360       | 012/0020  | 900                                         | 850      | 730       | 014/0020  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG GZ         | -                                                        | -        | -         | -         | 1100                                        | 1000     | 870       | 014/0054  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
| BG G          | 600                                                      | 540      | 480       | 012/0021  | 1200                                        | 1080     | 960       | 014/0031  | 38         | 12 | 1/2"                          | -                    | 100                                              | 1,6                                  |
|               |                                                          |          |           |           |                                             |          |           |           |            |    |                               |                      |                                                  |                                      |
| BH P          | 1000                                                     | 700      | 600       | 012/0031  | -                                           | -        | -         | -         | 56         | 18 | 3/4"                          | 1/4"                 | 160                                              | 3,2                                  |
| BH M          | 1500                                                     | 1200     | 1000      | 012/0032  | -                                           | -        | -         | -         | 56         | 18 | 3/4"                          | 1/4"                 | 160                                              | 3,2                                  |
| BH G          | 2000                                                     | 1700     | 1400      | 012/0033  | -                                           | -        | -         | -         | 56         | 18 | 3/4"                          | 1/4"                 | 160                                              | 3,2                                  |
|               |                                                          |          |           |           |                                             |          |           |           |            |    |                               |                      |                                                  |                                      |
| BHG P         | 3000                                                     | 2200     | 2000      | 012/0043  | -                                           | -        | -         | -         | 75         | 22 | 1 1/2"                        | -                    | 280                                              | 4,6                                  |
| BHG PZ        | 3700                                                     | 3000     | 2700      | 012/0080  | -                                           | -        | -         | -         | 75         | 22 | 1 1/2"                        | -                    | 280                                              | 4,6                                  |
| BHG M         | 4500                                                     | 3600     | 3200      | 012/0044  | -                                           | -        | -         | -         | 75         | 22 | 1 1/2"                        | -                    | 280                                              | 4,6                                  |
| BHG G         | 6000                                                     | 4800     | -         | 012/0045  | -                                           | -        | -         | -         | 75         | 22 | 1 1/2"                        | -                    | 280                                              | 4,6                                  |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Scaled drawings for series B

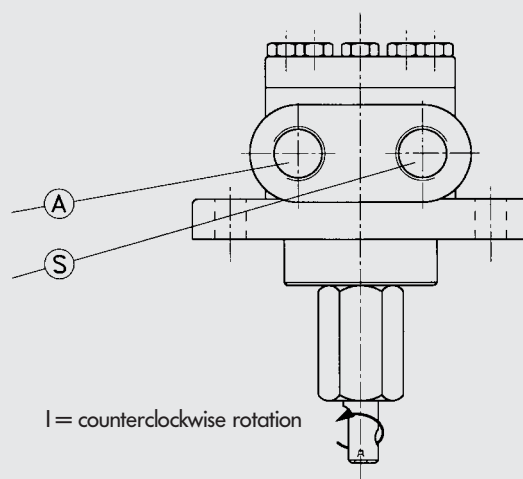
1.1

### Pipe connections cyl. with worth pipe threading G... A DIN ISO 228



suction  
connection  
  
delivery  
connection

D = clockwise rotation



I = counterclockwise rotation

| Gear rotor<br>size Ø | Discharge l/h          |                        | a1   | a2   | a3 | b1  | c1    | c2 | c3 | c4 | c5 | c6    | c7  | c8    | d1 |
|----------------------|------------------------|------------------------|------|------|----|-----|-------|----|----|----|----|-------|-----|-------|----|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |      |    |     |       |    |    |    |    |       |     |       |    |
| 25                   | 45 - 160               | 90 - 320               | 35,5 | 20   | 33 | 51  | 41,5  | 14 | 16 | 40 | 20 | 55,5  | 76  | 131,5 | 12 |
| 38                   | 150 - 600              | 300 - 1200             | 43   | 26,5 | 38 | 70  | 55,5  | 14 | 16 | 40 | 20 | 69,5  | 76  | 145,5 | 12 |
| 56                   | 1000 - 2000            | -                      | 48,5 | 38   | 45 | 96  | 71,5  | 15 | 18 | 79 | 27 | 86,5  | 124 | 210,5 | 18 |
| 75                   | 3000 - 6000            | -                      | 64,5 | 83   | 70 | 115 | 129,5 | 18 | 25 | 65 | 37 | 147,5 | 127 | 274,5 | 22 |

| Gear rotor<br>size Ø | Discharge l/h          |                        | sw | e    | d2 | d3  | e1       | e2  | f2   | f3  | f4  | g1 | h1   | h2 | h3 |
|----------------------|------------------------|------------------------|----|------|----|-----|----------|-----|------|-----|-----|----|------|----|----|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |    |      |    |     |          |     |      |     |     |    |      |    |    |
| 25                   | 45 - 160               | 90 - 320               | 27 | 31,2 | 54 | 80  | G 3/8"   | 71  | 16,5 | 38  | 92  | 43 | 11   | 13 | 13 |
| 38                   | 150 - 600              | 300 - 1200             | 27 | 31,2 | 54 | 80  | G 1/2"   | 82  | 19   | 44  | 92  | 43 | 11   | 13 | 13 |
| 56                   | 1000 - 2000            | -                      | 46 | 53,1 | 60 | 100 | G 3/4"   | 112 | 22,5 | 67  | 120 | 65 | 13   | 13 | 25 |
| 75                   | 3000 - 6000            | -                      | 55 | 63,5 | 80 | 120 | G 1 1/2" | 170 | 35   | 100 | 150 | 90 | 14,5 | 15 | -  |

Given a motive force of 56, the vacuum gauge and manometer connection is G 1/4" at the face.

## Series VB; with integrated overflow valve

1.2

### Technical selection chart: scaled drawings

Direction of rotation viewed from shaft  
**I** = indirect – counterclockwise  
**D** = direct – clockwise

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation as per the size chart/sheet when ordering!



Series VB

### hp-Internal gear pumps up to 40 bar (direction **I** = indirect – counterclockwise)

| Pump series<br>VB | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> at 20 °C |           |           |               |                                             |           |           |               | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection for (S/A) | Manometer connection | Max. allowed pump RPM (min <sup>-1</sup> ) | Net weight (kg) |
|-------------------|---------------------------------------------------------|-----------|-----------|---------------|---------------------------------------------|-----------|-----------|---------------|----------------------|------------|-------------------------------|----------------------|--------------------------------------------|-----------------|
|                   | n = 1400 min <sup>-1</sup><br>Discharge l/h             |           |           |               | n = 2800 min <sup>-1</sup><br>Discharge l/h |           |           |               |                      |            |                               |                      |                                            |                 |
|                   | at 9 bar                                                | at 30 bar | at 40 bar | Article-no. I | at 9 bar                                    | at 30 bar | at 40 bar | Article-no. I |                      |            |                               |                      |                                            |                 |
| Size:             | at 9 bar                                                | at 30 bar | at 40 bar | Article-no. I | at 9 bar                                    | at 30 bar | at 40 bar | Article-no. I |                      |            |                               |                      | at I/D                                     | at I/D          |
| VB P              | 45                                                      | 30        | 20        | 011/0007      | 90                                          | 60        | 50        | 013/0007      | 25                   | 12         | 3/8"                          | 1/4"                 | 2800                                       | 2,5             |
| VB M              | 80                                                      | 60        | 50        | 011/0008      | 160                                         | 130       | 120       | 013/0008      | 25                   | 12         | 3/8"                          | 1/4"                 | 2800                                       | 2,5             |
| VB G              | 120                                                     | 100       | 80        | 011/0009      | 240                                         | 200       | 190       | 013/0009      | 25                   | 12         | 3/8"                          | 1/4"                 | 2800                                       | 2,5             |
| VB F              | 160                                                     | 140       | 120       | 011/0010      | 320                                         | 270       | 260       | 013/0010      | 25                   | 12         | 3/8"                          | 1/4"                 | 2800                                       | 2,5             |
|                   |                                                         |           |           |               |                                             |           |           |               |                      |            |                               |                      |                                            |                 |
| VBG PP            | 150                                                     | 100       | 80        | 011/0055      | 300                                         | 240       | 210       | 013/0030      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG PZ            | 200                                                     | 160       | 140       | 011/0056      | 400                                         | 310       | 280       | 013/0056      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG P             | 300                                                     | 240       | 200       | 011/0022      | 600                                         | 520       | 480       | 013/0021      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG MZ            | -                                                       | -         | -         | -             | 850                                         | 750       | 700       | 013/0070      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG M             | 450                                                     | 390       | 360       | 011/0023      | 900                                         | 850       | 730       | 013/0022      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG GZ            | -                                                       | -         | -         | -             | 1100                                        | 1000      | 870       | 013/0065      | 38                   | 12         | 1/2"                          | 1/4"                 | 2800                                       | 3,3             |
| VBG G             | 600                                                     | 540       | 480       | 011/0024      | 1200                                        | 1080      | 960       | 013/0032      | 38                   | 12         | 1/2"                          | 1/4"                 | 1680                                       | 3,3             |
|                   |                                                         |           |           |               |                                             |           |           |               |                      |            |                               |                      |                                            |                 |
| VBH P             | 1000                                                    | 700       | 600       | 011/0034      | -                                           | -         | -         | -             | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 7,3             |
| VBH M             | 1500                                                    | 1200      | 1000      | 011/0035      | -                                           | -         | -         | -             | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 7,3             |
| VBH G             | 2000                                                    | 1700      | 1400      | 011/0036      | -                                           | -         | -         | -             | 56                   | 18         | 3/4"                          | 1/4"                 | 1680                                       | 7,3             |
|                   |                                                         |           |           |               |                                             |           |           |               |                      |            |                               |                      |                                            |                 |
| VBHG P            | 3000                                                    | 2200      | 2000      | 011/0046      | -                                           | -         | -         | -             | 75                   | 22         | 1 "                           | 1/4"                 | 1400                                       | 18,6            |
| VBHG PZ           | 3700                                                    | 3000      | 2700      | 011/0085      | -                                           | -         | -         | -             | 75                   | 22         | 1"                            | 1/4"                 | 1400                                       | 18,6            |
| VBHG M            | 4500                                                    | 3600      | 3200      | 011/0047      | -                                           | -         | -         | -             | 75                   | 22         | 1"                            | 1/4"                 | 1400                                       | 18,6            |
| VBHG G            | 6000                                                    | 4800      | -         | 011/0048      | -                                           | -         | -         | -             | 75                   | 22         | 1"                            | 1/4"                 | 1400                                       | 18,6            |

### hp-Internal gear pumps up to 40 bar (direction **D** = direct – clockwise)

| Pump series<br>VB | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> at 20 °C |              |              |                  |                                             |              |              |                  | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection for (S/A) | Manometer connection | Heating capacity<br>H1 in Watt<br>at 220V, 50Hz<br>at 1/D | Initial pump<br>breakaway<br>torque<br>at 1/D |
|-------------------|---------------------------------------------------------|--------------|--------------|------------------|---------------------------------------------|--------------|--------------|------------------|----------------------|------------|-------------------------------|----------------------|-----------------------------------------------------------|-----------------------------------------------|
|                   | n = 1400 min <sup>-1</sup><br>Discharge l/h             |              |              |                  | n = 2800 min <sup>-1</sup><br>Discharge l/h |              |              |                  |                      |            |                               |                      |                                                           |                                               |
| Size:             | at<br>9 bar                                             | at<br>30 bar | at<br>40 bar | Article-no.<br>D | at<br>9 bar                                 | at<br>30 bar | at<br>40 bar | Article-no.<br>D |                      |            |                               |                      |                                                           |                                               |
| VB P              | 45                                                      | 30           | 20           | 012/0007         | 90                                          | 60           | 50           | 014/0007         | 25                   | 12         | 3/8"                          | 1/4"                 | 100                                                       | 1,2                                           |
| VB M              | 80                                                      | 60           | 50           | 012/0008         | 160                                         | 130          | 120          | 014/0008         | 25                   | 12         | 3/8"                          | 1/4"                 | 100                                                       | 1,2                                           |
| VB G              | 120                                                     | 100          | 80           | 012/0009         | 240                                         | 200          | 190          | 014/0009         | 25                   | 12         | 3/8"                          | 1/4"                 | 100                                                       | 1,2                                           |
| VB F              | 160                                                     | 140          | 120          | 012/0010         | 320                                         | 270          | 260          | 014/0010         | 25                   | 12         | 3/8"                          | 1/4"                 | 100                                                       | 1,2                                           |
|                   |                                                         |              |              |                  |                                             |              |              |                  |                      |            |                               |                      |                                                           |                                               |
| VBG PP            | 150                                                     | 100          | 80           | 012/0055         | 300                                         | 240          | 210          | 014/0030         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG PZ            | 200                                                     | 160          | 140          | 012/0056         | 400                                         | 310          | 280          | 014/0056         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG P             | 300                                                     | 240          | 200          | 012/0022         | 600                                         | 520          | 480          | 014/0021         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG MZ            | -                                                       | -            | -            | -                | 850                                         | 750          | 700          | 014/0070         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG M             | 450                                                     | 390          | 360          | 012/0023         | 900                                         | 850          | 730          | 014/0022         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG GZ            | -                                                       | -            | -            | -                | 1100                                        | 1000         | 870          | 014/0065         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
| VBG G             | 600                                                     | 540          | 480          | 012/0024         | 1200                                        | 1080         | 960          | 014/0032         | 38                   | 12         | 1/2"                          | 1/4"                 | 100                                                       | 1,6                                           |
|                   |                                                         |              |              |                  |                                             |              |              |                  |                      |            |                               |                      |                                                           |                                               |
| VBH P             | 1000                                                    | 700          | 600          | 012/0034         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                          | 1/4"                 | 160                                                       | 3,2                                           |
| VBH M             | 1500                                                    | 1200         | 1000         | 012/0035         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                          | 1/4"                 | 160                                                       | 3,2                                           |
| VBH G             | 2000                                                    | 1700         | 1400         | 012/0036         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                          | 1/4"                 | 160                                                       | 3,2                                           |
|                   |                                                         |              |              |                  |                                             |              |              |                  |                      |            |                               |                      |                                                           |                                               |
| VBHG P            | 3000                                                    | 2200         | 2000         | 012/0046         | -                                           | -            | -            | -                | 75                   | 22         | 1"                            | 1/4"                 | 280                                                       | 4,6                                           |
| VBHG PZ           | 3700                                                    | 3000         | 2700         | 012/0085         | -                                           | -            | -            | -                | 75                   | 22         | 1"                            | 1/4"                 | 280                                                       | 4,6                                           |
| VBHG M            | 4500                                                    | 3600         | 3200         | 012/0047         | -                                           | -            | -            | -                | 75                   | 22         | 1"                            | 1/4"                 | 280                                                       | 4,6                                           |
| VBHG G            | 6000                                                    | 4800         | -            | 012/0048         | -                                           | -            | -            | -                | 75                   | 22         | 1"                            | 1/4"                 | 280                                                       | 4,6                                           |

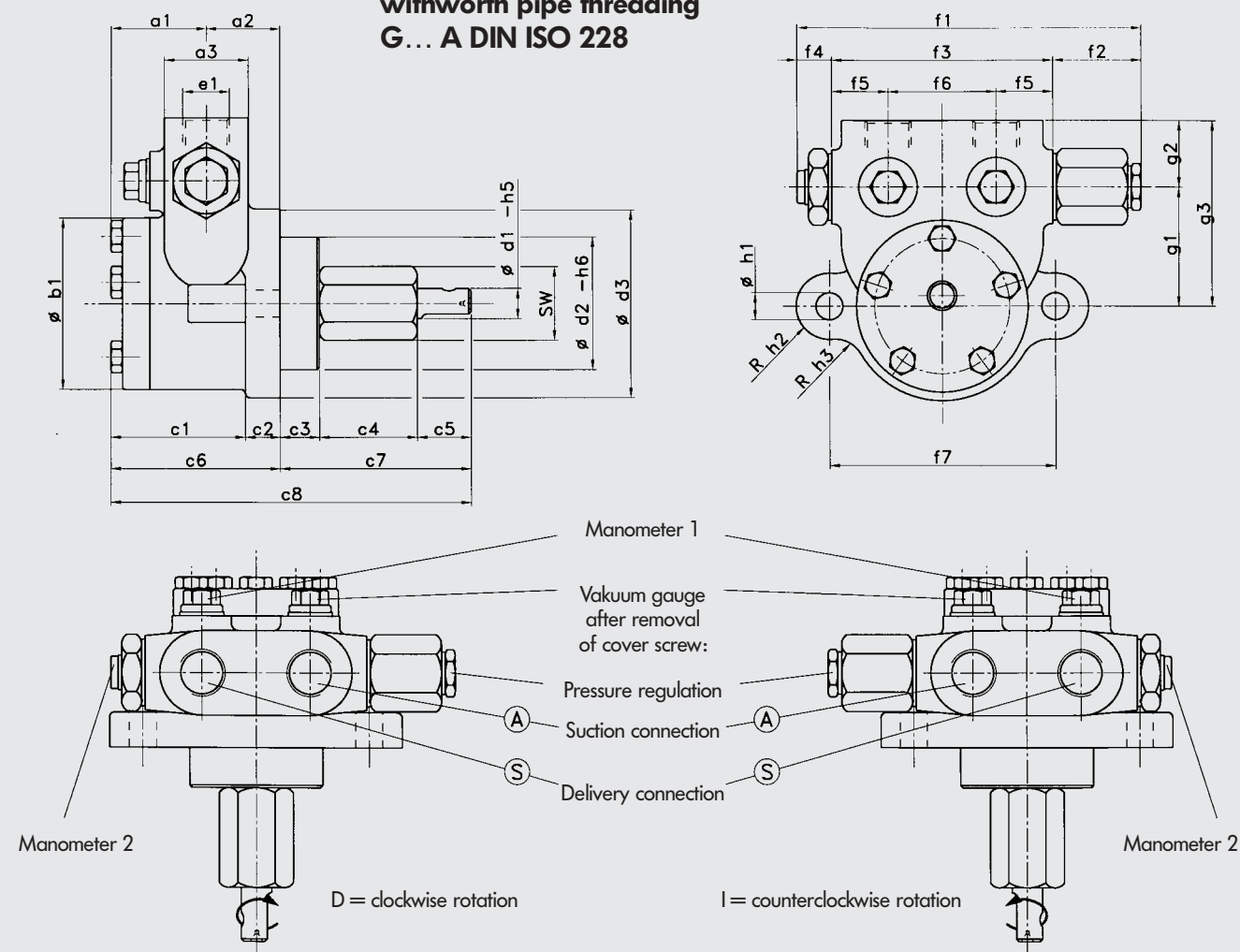
\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.



## Scaled drawings for series VB

1.2

**Manometer connection cyl.  
with worth pipe threading  
G... A DIN ISO 228**



| Gear rotor<br>size Ø | Discharge l/h          |                        | a1   | a2 | a3 | b1  | c1    | c2 | c3 | c4 | c5 | c6    | c7  |
|----------------------|------------------------|------------------------|------|----|----|-----|-------|----|----|----|----|-------|-----|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |    |    |     |       |    |    |    |    |       |     |
| 25                   | 45 - 160               | 90 - 320               | 35,5 | 20 | 33 | 51  | 41,5  | 14 | 16 | 40 | 20 | 55,5  | 76  |
| 38                   | 150 - 600              | 300 - 1200             | 39,5 | 30 | 38 | 70  | 55,5  | 14 | 16 | 40 | 20 | 69,5  | 76  |
| 56                   | 1000 - 2000            | -                      | 48,5 | 38 | 45 | 96  | 71,5  | 15 | 18 | 79 | 27 | 86,5  | 124 |
| 75                   | 3000 - 6000            | -                      | 62,5 | 85 | 70 | 115 | 129,5 | 18 | 25 | 65 | 37 | 147,5 | 127 |

| Gear rotor<br>size Ø | Discharge l/h          |                        | c8    | d1 | sw/e    | d2 | d3  | e1     | f1  | f2   | f3  | f4   |   |
|----------------------|------------------------|------------------------|-------|----|---------|----|-----|--------|-----|------|-----|------|---|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |       |    |         |    |     |        |     |      |     |      |   |
| 25                   | 45 - 160               | 90 - 320               | 131,5 | 12 | 27/31,2 | 54 | 80  | G 3/8" | 139 | 32   | 90  | 17   | - |
| 38                   | 150 - 600              | 300 - 1200             | 145,5 | 12 | 27/31,2 | 54 | 80  | G 1/2" | 139 | 32   | 90  | 17   | - |
| 56                   | 1000 - 2000            | -                      | 210,5 | 18 | 46/53,1 | 60 | 100 | G 3/4" | 162 | 26,5 | 118 | 17,5 | - |
| 75                   | 3000 - 6000            | -                      | 274,5 | 22 | 55/63,5 | 80 | 120 | G 1"   | 211 | 36   | 150 | 25   | - |

| Gear rotor<br>size Ø | Discharge l/h          |                        | f5   | f6 | f7  | f8  | g1 | g2 | g3  | h1   | h2 | h3 |   |
|----------------------|------------------------|------------------------|------|----|-----|-----|----|----|-----|------|----|----|---|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |    |     |     |    |    |     |      |    |    |   |
| 25                   | 45 - 160               | 90 - 320               | 26   | 38 | 92  | 140 | 40 | 27 | 67  | 11   | 13 | 13 | - |
| 38                   | 150 - 600              | 300 - 1200             | 23   | 44 | 92  | 140 | 48 | 27 | 75  | 11   | 13 | 13 | - |
| 56                   | 1000 - 2000            | -                      | 25,5 | 67 | 120 | 171 | 55 | 35 | 90  | 13   | 13 | 25 | - |
| 75                   | 3000 - 6000            | -                      | 35   | 80 | 150 | 218 | 80 | 40 | 120 | 14,5 | 15 | -  | - |

## Series VBR; with integrated overflow valve and bypass

1.3

### Technical selection chart: scaled drawings

Direction of rotation viewed from shaft  
**I** = indirect – counterclockwise  
**D** = direct – clockwise

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation as per the size chart/sheet when ordering!



### hp-Internal gear pumps up to 40 bar (direction **I** = indirect – counterclockwise)

| Pump series<br>VBR | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> bei 20 °C |          |           |           |                                             |          |           |           | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection for (S/A/R) | Manometer connection | Max. allowed pump RPM (min <sup>-1</sup> ) | Net weight (kg) |
|--------------------|----------------------------------------------------------|----------|-----------|-----------|---------------------------------------------|----------|-----------|-----------|----------------------|------------|---------------------------------|----------------------|--------------------------------------------|-----------------|
|                    | n = 1400 min <sup>-1</sup><br>Discharge l/h              |          |           |           | n = 2800 min <sup>-1</sup><br>Discharge l/h |          |           |           |                      |            |                                 |                      |                                            |                 |
|                    | Size:                                                    | at 9 bar | at 30 bar | at 40 bar | Article-no. I                               | at 9 bar | at 30 bar | at 40 bar |                      |            |                                 |                      | Article-no. I                              | at I/D          |
| VBR P              | 45                                                       | 30       | 20        | 011/0011  | 90                                          | 60       | 50        | 013/0011  | 25                   | 12         | 3/8"                            | –                    | 2800                                       | 2,5             |
| VBR M              | 80                                                       | 60       | 50        | 011/0012  | 160                                         | 130      | 120       | 013/0012  | 25                   | 12         | 3/8"                            | –                    | 2800                                       | 2,5             |
| VBR G              | 120                                                      | 100      | 80        | 011/0013  | 240                                         | 200      | 190       | 013/0013  | 25                   | 12         | 3/8"                            | –                    | 2800                                       | 2,5             |
| VBR F              | 160                                                      | 140      | 120       | 011/0014  | 320                                         | 270      | 260       | 013/0014  | 25                   | 12         | 3/8"                            | –                    | 2800                                       | 2,5             |
|                    |                                                          |          |           |           |                                             |          |           |           |                      |            |                                 |                      |                                            |                 |
| VBGR PP            | 150                                                      | 100      | 80        | 011/0065  | 300                                         | 240      | 210       | 013/0040  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR PZ            | 200                                                      | 160      | 140       | 011/0062  | 400                                         | 310      | 280       | 013/0041  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR P             | 300                                                      | 240      | 200       | 011/0025  | 600                                         | 520      | 480       | 013/0023  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR MZ            | –                                                        | –        | –         | –         | 850                                         | 750      | 700       | 013/0072  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR M             | 450                                                      | 390      | 360       | 011/0026  | 900                                         | 850      | 730       | 013/0024  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR GZ            | –                                                        | –        | –         | –         | 1100                                        | 1000     | 870       | 013/0042  | 38                   | 12         | 1/2"                            | –                    | 2800                                       | 3,3             |
| VBGR G             | 600                                                      | 540      | 480       | 011/0027  | 1200                                        | 1080     | 960       | 013/0043  | 38                   | 12         | 1/2"                            | –                    | 1680                                       | 3,3             |
|                    |                                                          |          |           |           |                                             |          |           |           |                      |            |                                 |                      |                                            |                 |
| VBHR P             | 1000                                                     | 700      | 600       | 011/0037  | –                                           | –        | –         | –         | 56                   | 18         | 3/4"                            | 1/8"                 | 1680                                       | 7,3             |
| VBHR M             | 1500                                                     | 1200     | 1000      | 011/0038  | –                                           | –        | –         | –         | 56                   | 18         | 3/4"                            | 1/8"                 | 1680                                       | 7,3             |
| VBHR G             | 2000                                                     | 1700     | 1400      | 011/0039  | –                                           | –        | –         | –         | 56                   | 18         | 3/4"                            | 1/8"                 | 1680                                       | 7,3             |
|                    |                                                          |          |           |           |                                             |          |           |           |                      |            |                                 |                      |                                            |                 |
| VBHGR P            | 3000                                                     | 2200     | 2000      | 011/0049  | –                                           | –        | –         | –         | 75                   | 22         | 1 "                             | 1/4"                 | 1400                                       | 18,6            |
| VBHGR PZ           | 3700                                                     | 3000     | 2700      | 011/0090  | –                                           | –        | –         | –         | 75                   | 22         | 1"                              | 1/4"                 | 1400                                       | 18,6            |
| VBHGR M            | 4500                                                     | 3600     | 3200      | 011/0050  | –                                           | –        | –         | –         | 75                   | 22         | 1"                              | 1/4"                 | 1400                                       | 18,6            |
| VBHGR G            | 6000                                                     | 4800     | –         | 011/0051  | –                                           | –        | –         | –         | 75                   | 22         | 1"                              | 1/4"                 | 1400                                       | 18,6            |

### hp-Internal gear pumps up to 40 bar (direction **D** = direct – clockwise)

| Pump series<br><b>VBR</b> | Viscosity: 6 mm² sec <sup>-1</sup> bei 20 °C |             |              |              |                                             |             |              |              | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection<br>for (S/A/R) | Manometer connection | Heating capacity<br>H1 in Watt<br>at 220V, 50Hz | Initial pump<br>breakaway torque |
|---------------------------|----------------------------------------------|-------------|--------------|--------------|---------------------------------------------|-------------|--------------|--------------|----------------------|------------|------------------------------------|----------------------|-------------------------------------------------|----------------------------------|
|                           | n = 1400 min <sup>-1</sup><br>Discharge l/h  |             |              |              | n = 2800 min <sup>-1</sup><br>Discharge l/h |             |              |              |                      |            |                                    |                      |                                                 |                                  |
|                           | Size:                                        | at<br>9 bar | at<br>30 bar | at<br>40 bar | Article-no.<br>I                            | at<br>9 bar | at<br>30 bar | at<br>40 bar |                      |            |                                    |                      |                                                 |                                  |
| VBR P                     | 45                                           | 30          | 20           | 012/0011     | 90                                          | 60          | 50           | 014/0011     | 25                   | 12         | 3/8"                               | –                    | 100                                             | 1,2                              |
| VBR M                     | 80                                           | 60          | 50           | 012/0012     | 160                                         | 130         | 120          | 014/0012     | 25                   | 12         | 3/8"                               | –                    | 100                                             | 1,2                              |
| VBR G                     | 120                                          | 100         | 80           | 012/0013     | 240                                         | 200         | 190          | 014/0013     | 25                   | 12         | 3/8"                               | –                    | 100                                             | 1,2                              |
| VBR F                     | 160                                          | 140         | 120          | 012/0014     | 320                                         | 270         | 260          | 014/0014     | 25                   | 12         | 3/8"                               | –                    | 100                                             | 1,2                              |
|                           |                                              |             |              |              |                                             |             |              |              |                      |            |                                    |                      |                                                 |                                  |
| VBGR PP                   | 150                                          | 100         | 80           | 012/0065     | 300                                         | 240         | 210          | 014/0040     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR PZ                   | 200                                          | 160         | 140          | 012/0062     | 400                                         | 310         | 280          | 014/0041     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR P                    | 300                                          | 240         | 200          | 012/0025     | 600                                         | 520         | 480          | 014/0023     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR MZ                   | –                                            | –           | –            | –            | 850                                         | 750         | 700          | 014/0072     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR M                    | 450                                          | 390         | 360          | 012/0026     | 900                                         | 850         | 730          | 014/0024     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR GZ                   | –                                            | –           | –            | –            | 1100                                        | 1000        | 870          | 014/0042     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
| VBGR G                    | 600                                          | 540         | 480          | 012/0027     | 1200                                        | 1080        | 960          | 014/0043     | 38                   | 12         | 1/2"                               | –                    | 100                                             | 1,6                              |
|                           |                                              |             |              |              |                                             |             |              |              |                      |            |                                    |                      |                                                 |                                  |
| VBHR P                    | 1000                                         | 700         | 600          | 012/0037     | –                                           | –           | –            | –            | 56                   | 18         | 3/4"                               | 1/8"                 | 160                                             | 3,2                              |
| VBHR M                    | 1500                                         | 1200        | 1000         | 012/0038     | –                                           | –           | –            | –            | 56                   | 18         | 3/4"                               | 1/8"                 | 160                                             | 3,2                              |
| VBHR G                    | 2000                                         | 1700        | 1400         | 012/0039     | –                                           | –           | –            | –            | 56                   | 18         | 3/4"                               | 1/8"                 | 160                                             | 3,2                              |
|                           |                                              |             |              |              |                                             |             |              |              |                      |            |                                    |                      |                                                 |                                  |
| VBHGR P                   | 3000                                         | 2200        | 2000         | 012/0049     | –                                           | –           | –            | –            | 75                   | 22         | 1"                                 | 1/4"                 | 280                                             | 4,6                              |
| VBHGR PZ                  | 3700                                         | 3000        | 2700         | 012/0090     | –                                           | –           | –            | –            | 75                   | 22         | 1"                                 | 1/4"                 | 280                                             | 4,6                              |
| VBHGR M                   | 4500                                         | 3600        | 3200         | 012/0050     | –                                           | –           | –            | –            | 75                   | 22         | 1"                                 | 1/4"                 | 280                                             | 4,6                              |
| VBHGR G                   | 6000                                         | 4800        | –            | 012/0051     | –                                           | –           | –            | –            | 75                   | 22         | 1"                                 | 1/4"                 | 280                                             | 4,6                              |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Scaled drawings for series VBR

1.3

Industrial pumps,  
overflow valves

Motor pump program,  
motor pump groups

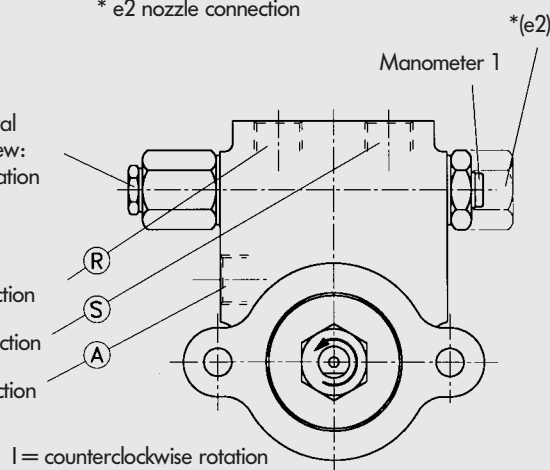
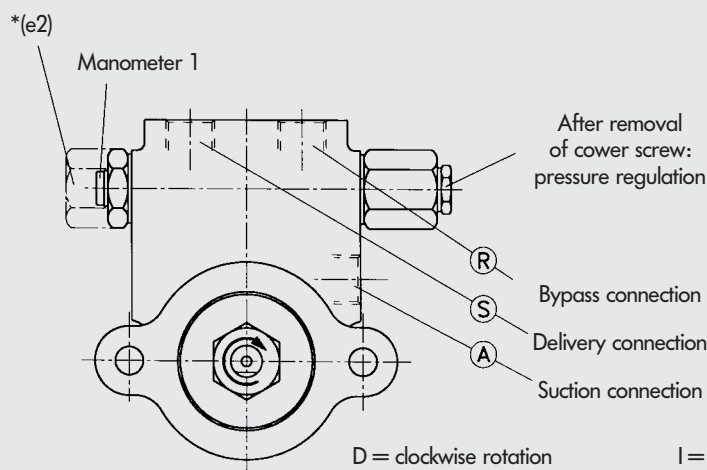
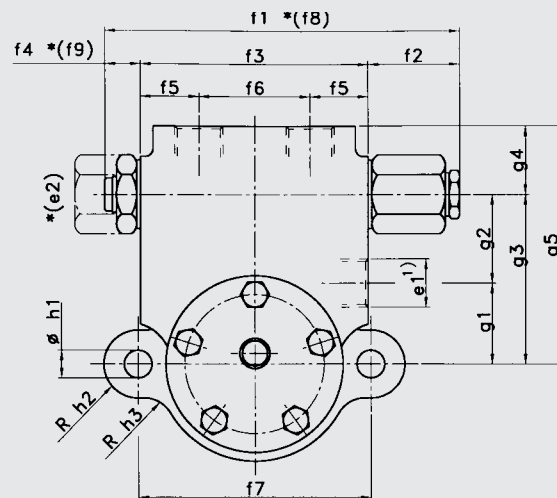
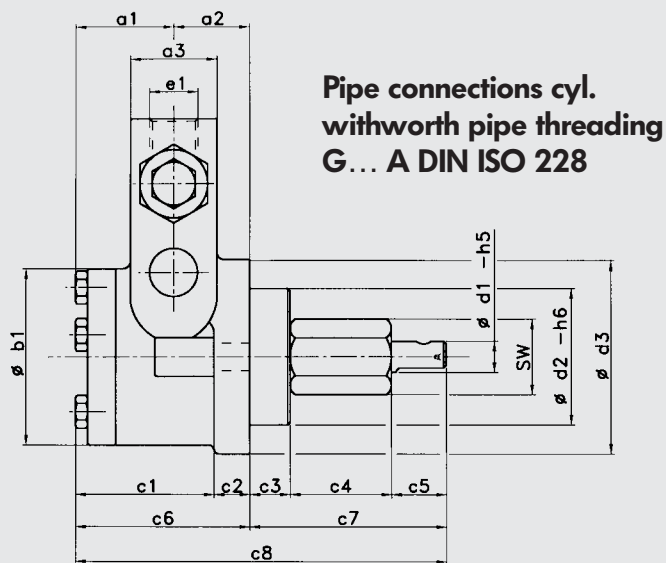
Aggregates for single  
pipe installation

Feed pumps and  
delivery aggregates

Accessories and  
spare parts

Oil burner nozzles

Special aggregates,  
terms of sale



| Model | Discharge l/h          |                        | a1   | a2 | a3 | b1  | c1    | c2 | c3 | c4 | c5 | c6    | c7  | c8    |
|-------|------------------------|------------------------|------|----|----|-----|-------|----|----|----|----|-------|-----|-------|
|       | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |    |    |     |       |    |    |    |    |       |     |       |
| 25    | 45 - 160               | 90 - 320               | 35,5 | 20 | 33 | 51  | 41,5  | 14 | 16 | 40 | 20 | 55,5  | 76  | 131,5 |
| 38    | 150 - 600              | 300 - 1200             | 39,5 | 30 | 38 | 70  | 55,5  | 14 | 16 | 40 | 20 | 69,5  | 76  | 145,5 |
| 56    | 1000 - 2000            | -                      | 48,5 | 38 | 45 | 96  | 71,5  | 15 | 18 | 79 | 27 | 86,5  | 124 | 210,5 |
| 75    | 3000 - 6000            | -                      | 62,5 | 85 | 70 | 115 | 129,5 | 18 | 25 | 65 | 37 | 147,5 | 127 | 274,5 |

| Model | Discharge l/h          |                        | d1 | sw | e    | d2 | d3  | e1     | *e2    | f1  | f2   | f3  | f4   | f5   |
|-------|------------------------|------------------------|----|----|------|----|-----|--------|--------|-----|------|-----|------|------|
|       | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |    |    |      |    |     |        |        |     |      |     |      |      |
| 25    | 45 - 160               | 90 - 320               | 12 | 27 | 31,2 | 54 | 80  | G 3/8" | G 3/8" | 139 | 32   | 90  | 17   | 26   |
| 38    | 150 - 600              | 300 - 1200             | 12 | 27 | 31,2 | 54 | 80  | G 1/2" | G 3/8" | 139 | 32   | 90  | 17   | 23   |
| 56    | 1000 - 2000            | -                      | 18 | 46 | 53   | 60 | 100 | G 3/4" | G 3/8" | 162 | 26,5 | 118 | 17,5 | 25,5 |
| 75    | 3000 - 6000            | -                      | 22 | 55 | 63,5 | 80 | 120 | G 1"   | G 3/8" | 211 | 36   | 150 | 25   | 35   |

| Model | Discharge l/h          |                        | f6 | f7  | f8  | f9   | g1 | g2 | g3 | g4 | g5  | h1   | h2 | h3 |
|-------|------------------------|------------------------|----|-----|-----|------|----|----|----|----|-----|------|----|----|
|       | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |    |     |     |      |    |    |    |    |     |      |    |    |
| 25    | 45 - 160               | 90 - 320               | 38 | 92  | 140 | 18   | 30 | 33 | 63 | 27 | 90  | 11   | 13 | 13 |
| 38    | 150 - 600              | 300 - 1200             | 44 | 92  | 140 | 18   | 32 | 35 | 67 | 27 | 94  | 11   | 13 | 13 |
| 56    | 1000 - 2000            | -                      | 67 | 120 | 171 | 26,5 | 38 | 42 | 80 | 35 | 115 | 13   | 13 | 25 |
| 75    | 3000 - 6000            | -                      | 80 | 150 | 218 | 32   | 18 | 62 | 80 | 40 | 120 | 14,5 | 15 | -  |

VBHGR model with G 1/4" manometer connection at the face.

1) Given a motive force of 75 = 3000 to 6000 l/h, the suction connection at the side is G1 1/2".

## Series NV; with integrated overflow valve and bypass

1.4

### Technical selection chart: scaled drawings

Direction of rotation viewed from shaft  
**I** = indirect – counterclockwise  
**D** = direct – clockwise

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation as per the size chart/sheet when ordering!



Series NV

### hp-Internal gear pumps up to 40 bar (direction **I** = indirect – counterclockwise)

| Pump series<br>NV | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> bei 20 °C |           |           |                  |                                             |           |           |                  | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection<br>for (S/A/R) | Manometer connection | Max. allowed pump RPM<br>(min <sup>-1</sup> ) | Net weight<br>(kg) |
|-------------------|----------------------------------------------------------|-----------|-----------|------------------|---------------------------------------------|-----------|-----------|------------------|----------------------|------------|------------------------------------|----------------------|-----------------------------------------------|--------------------|
|                   | n = 1400 min <sup>-1</sup><br>Discharge l/h              |           |           |                  | n = 2800 min <sup>-1</sup><br>Discharge l/h |           |           |                  |                      |            |                                    |                      |                                               |                    |
| Size              | at 9 bar                                                 | at 30 bar | at 40 bar | Article-no.<br>I | at 9 bar                                    | at 30 bar | at 40 bar | Article-no.<br>I |                      |            |                                    |                      | at I/D                                        | at I/D             |
| NVBR P            | 45                                                       | 30        | 20        | 011/0015         | 90                                          | 60        | 50        | 013/0015         | 25                   | 12         | 3/8"                               | 1/4"                 | 2800                                          | 2,8                |
| NVBR M            | 80                                                       | 60        | 50        | 011/0016         | 160                                         | 130       | 120       | 013/0016         | 25                   | 12         | 3/8"                               | 1/4"                 | 2800                                          | 2,8                |
| NVBR G            | 120                                                      | 100       | 80        | 011/0017         | 240                                         | 200       | 190       | 013/0017         | 25                   | 12         | 3/8"                               | 1/4"                 | 2800                                          | 2,8                |
| NVBR F            | 160                                                      | 140       | 120       | 011/0018         | 320                                         | 270       | 260       | 013/0018         | 25                   | 12         | 3/8"                               | 1/4"                 | 2800                                          | 2,8                |
|                   |                                                          |           |           |                  |                                             |           |           |                  |                      |            |                                    |                      |                                               |                    |
| NVBGR PP          | 150                                                      | 100       | 80        | 011/0075         | 300                                         | 240       | 210       | 013/0025         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR PZ          | 200                                                      | 160       | 140       | 011/0076         | 400                                         | 310       | 280       | 013/0028         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR P           | 300                                                      | 240       | 200       | 011/0028         | 600                                         | 520       | 480       | 013/0026         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR MZ          | -                                                        | -         | -         | -                | 850                                         | 750       | 700       | 013/0074         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR M           | 450                                                      | 390       | 360       | 011/0029         | 900                                         | 850       | 730       | 013/0027         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR GZ          | -                                                        | -         | -         | -                | 1100                                        | 1000      | 870       | 013/0029         | 38                   | 12         | 1/2"                               | 1/4"                 | 2800                                          | 3,8                |
| NVBGR G           | 600                                                      | 540       | 480       | 011/0030         | 1200                                        | 1080      | 960       | 013/0034         | 38                   | 12         | 1/2"                               | 1/4"                 | 1680                                          | 3,8                |
|                   |                                                          |           |           |                  |                                             |           |           |                  |                      |            |                                    |                      |                                               |                    |
| NVBHR P           | 1000                                                     | 700       | 600       | 011/0040         | -                                           | -         | -         | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 1400                                          | 8,6                |
| NVBHR M           | 1500                                                     | 1200      | 1000      | 011/0041         | -                                           | -         | -         | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 1400                                          | 8,6                |
| NVBHR G           | 2000                                                     | 1700      | 1400      | 011/0042         | -                                           | -         | -         | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 1400                                          | 8,6                |

### hp-Internal gear pumps up to 40 bar (direction **D** = direct – clockwise)

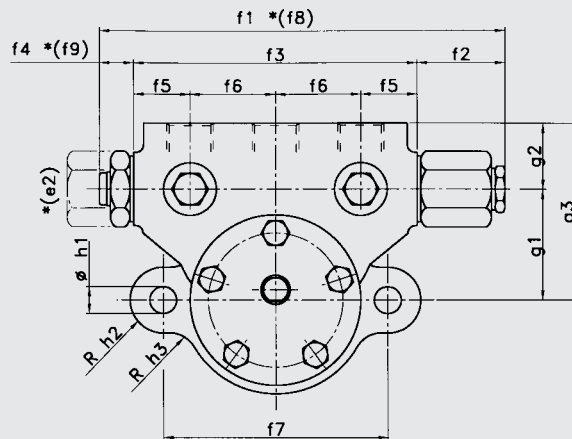
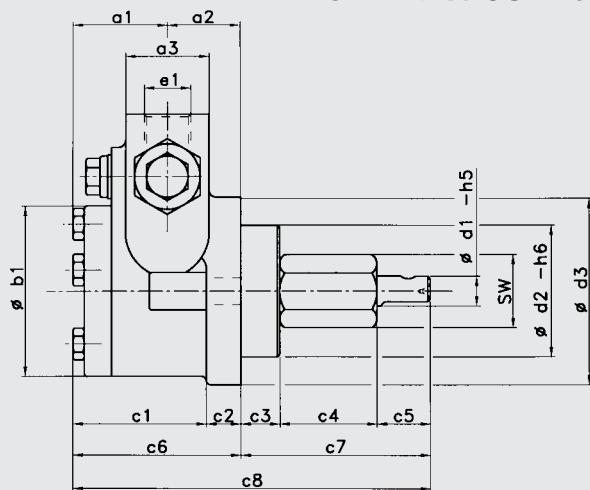
| Pump series<br>NV | Viscosity: 6 mm² sec <sup>-1</sup> bei 20 °C |              |              |                  |                                             |              |              |                  | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection<br>for (S/A/R) | Manometer connection | Heating capacity<br>(Watt)<br>at 220V, 50HZ<br>at I/D | Initial pump<br>breakaway<br>torque at I/D |
|-------------------|----------------------------------------------|--------------|--------------|------------------|---------------------------------------------|--------------|--------------|------------------|----------------------|------------|------------------------------------|----------------------|-------------------------------------------------------|--------------------------------------------|
|                   | n = 1400 min <sup>-1</sup><br>Discharge l/h  |              |              |                  | n = 2800 min <sup>-1</sup><br>Discharge l/h |              |              |                  |                      |            |                                    |                      |                                                       |                                            |
|                   | at<br>9 bar                                  | at<br>30 bar | at<br>40 bar | Article-no.<br>D | at<br>9 bar                                 | at<br>30 bar | at<br>40 bar | Article-no.<br>D |                      |            |                                    |                      |                                                       |                                            |
| Size              |                                              |              |              |                  |                                             |              |              |                  |                      |            |                                    |                      |                                                       |                                            |
| NVBR P            | 45                                           | 30           | 20           | 012/0015         | 90                                          | 60           | 50           | 014/0015         | 25                   | 12         | 3/8"                               | 1/4"                 | 100                                                   | 1,2                                        |
| NVBR M            | 80                                           | 60           | 50           | 012/0016         | 160                                         | 130          | 120          | 014/0016         | 25                   | 12         | 3/8"                               | 1/4"                 | 100                                                   | 1,2                                        |
| NVBR G            | 120                                          | 100          | 80           | 012/0017         | 240                                         | 200          | 190          | 014/0017         | 25                   | 12         | 3/8"                               | 1/4"                 | 100                                                   | 1,2                                        |
| NVBR F            | 160                                          | 140          | 120          | 012/0018         | 320                                         | 270          | 260          | 014/0018         | 25                   | 12         | 3/8"                               | 1/4"                 | 100                                                   | 1,2                                        |
|                   |                                              |              |              |                  |                                             |              |              |                  |                      |            |                                    |                      |                                                       |                                            |
| NVBGR PP          | 150                                          | 100          | 80           | 012/0075         | 300                                         | 240          | 210          | 014/0025         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR PZ          | 200                                          | 160          | 140          | 012/0076         | 400                                         | 310          | 280          | 014/0028         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR P           | 300                                          | 240          | 200          | 012/0028         | 600                                         | 520          | 480          | 014/0026         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR MZ          | -                                            | -            | -            | -                | 850                                         | 750          | 700          | 014/0074         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR M           | 450                                          | 390          | 360          | 012/0029         | 900                                         | 850          | 730          | 014/0027         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR GZ          | -                                            | -            | -            | -                | 1100                                        | 1000         | 870          | 014/0029         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
| NVBGR G           | 600                                          | 540          | 480          | 012/0030         | 1200                                        | 1080         | 960          | 014/0034         | 38                   | 12         | 1/2"                               | 1/4"                 | 100                                                   | 1,6                                        |
|                   |                                              |              |              |                  |                                             |              |              |                  |                      |            |                                    |                      |                                                       |                                            |
| NVBHR P           | 1000                                         | 700          | 600          | 012/0040         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 160                                                   | 3,2                                        |
| NVBHR M           | 1500                                         | 1200         | 1000         | 012/0041         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 160                                                   | 3,2                                        |
| NVBHR G           | 2000                                         | 1700         | 1400         | 012/0042         | -                                           | -            | -            | -                | 56                   | 18         | 3/4"                               | 1/4"                 | 160                                                   | 3,2                                        |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

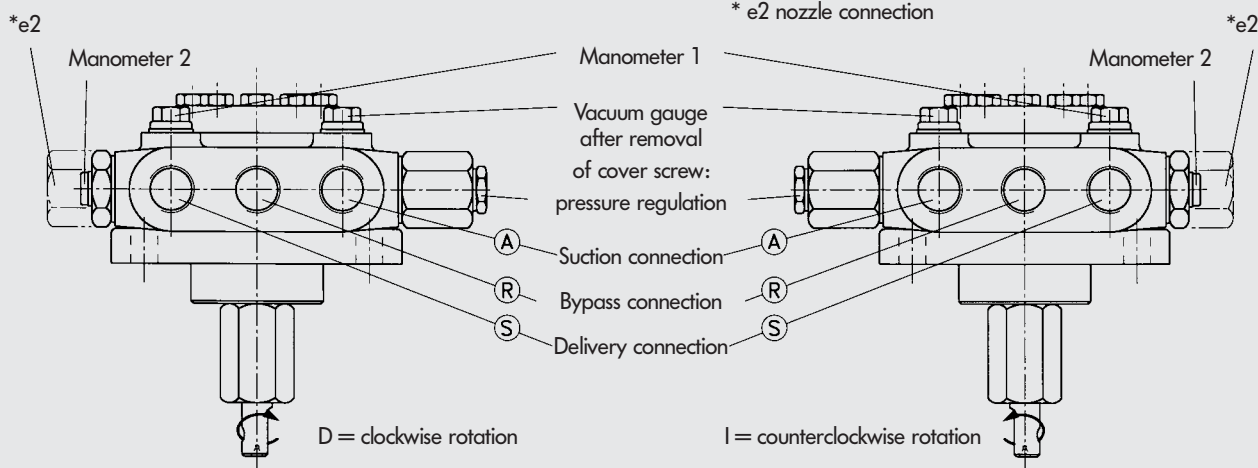
**Scaled drawings for series NV**

**1.4**

**Pipe connections cyl.  
with worth pipe threading  
G... A DIN ISO 228**



Special Model:  
\* with SC quick-close  
\* e2 nozzle connection



| Gear rotor<br>size Ø | Discharge l/h          |                        | a1   | a2 | a3 | b1 | c1   | c2 | c3 | c4 | c5 | c6   | c7  |
|----------------------|------------------------|------------------------|------|----|----|----|------|----|----|----|----|------|-----|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |    |    |    |      |    |    |    |    |      |     |
| 25                   | 45 - 160               | 90 - 320               | 35,5 | 20 | 33 | 51 | 41,5 | 14 | 16 | 40 | 20 | 55,5 | 76  |
| 38                   | 150 - 600              | 300 - 1200             | 39,5 | 30 | 38 | 70 | 55,5 | 14 | 16 | 40 | 20 | 69,5 | 76  |
| 56                   | 1000 - 2000            | -                      | 48,5 | 38 | 45 | 96 | 71,5 | 15 | 18 | 79 | 27 | 86,5 | 124 |

| Gear rotor<br>size Ø | Discharge l/h          |                        | c8    | d1 | sw/e    | d2 | d3  | e1     | *e2    | f1  | f2   | f3  | f4   |
|----------------------|------------------------|------------------------|-------|----|---------|----|-----|--------|--------|-----|------|-----|------|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |       |    |         |    |     |        |        |     |      |     |      |
| 25                   | 45 - 160               | 90 - 320               | 131,5 | 12 | 27/31,2 | 54 | 80  | G 3/8" | G 3/8" | 165 | 32   | 116 | 17   |
| 38                   | 150 - 600              | 300 - 1200             | 145,5 | 12 | 27/31,2 | 54 | 80  | G 1/2" | G 3/8" | 165 | 32   | 116 | 17   |
| 56                   | 1000 - 2000            | -                      | 210,5 | 18 | 46/53,1 | 60 | 100 | G 3/4" | G 3/8" | 194 | 26,5 | 150 | 17,5 |

| Gear rotor<br>size Ø | Discharge l/h          |                        | f5   | f6   | f7  | f8  | f9   | g1 | g2 | g3  | h1 | h2 | h3 |
|----------------------|------------------------|------------------------|------|------|-----|-----|------|----|----|-----|----|----|----|
|                      | 1400 min <sup>-1</sup> | 2800 min <sup>-1</sup> |      |      |     |     |      |    |    |     |    |    |    |
| 25                   | 45 - 160               | 90 - 320               | 25,5 | 32,5 | 92  | 166 | 18   | 40 | 27 | 67  | 11 | 13 | 13 |
| 38                   | 150 - 600              | 300 - 1200             | 23   | 35   | 92  | 166 | 18   | 45 | 27 | 72  | 11 | 13 | 13 |
| 56                   | 1000 - 2000            | -                      | 25   | 50   | 120 | 203 | 26,5 | 65 | 40 | 105 | 13 | 13 | 25 |

With G 1/4" manometer connection at the face.



## Series UHE; with integrated overflow valve and bypass

1.5

### Technical selection chart:

Direction of rotation of the pumps **I** = indirect – counterclockwise  
**D** = direct – clockwise

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation as per dimension sheet when ordering.  
Standard design of the pump for two pipe installation, design for one pipe installation on enquiry!



### hp-Internal gear pumps up to 40 bar (direction of rotation **I** = direct – counter clockwise)

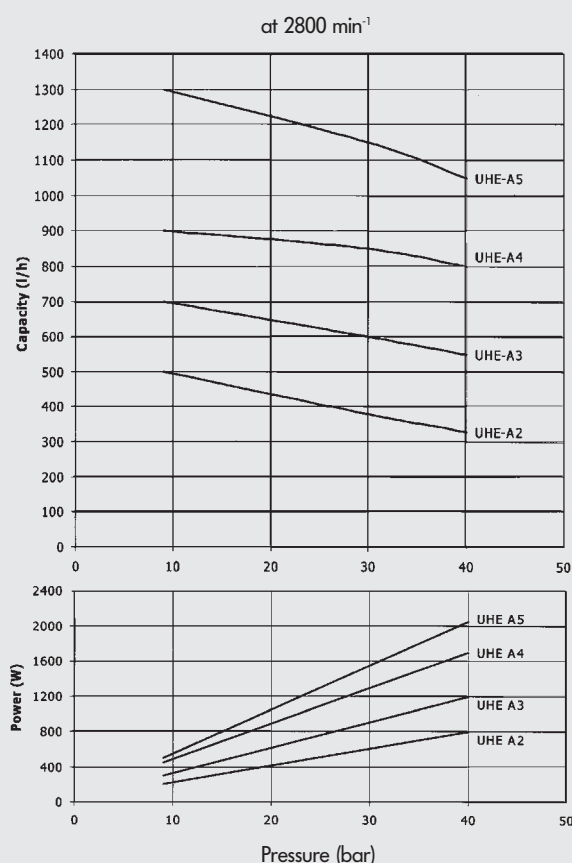
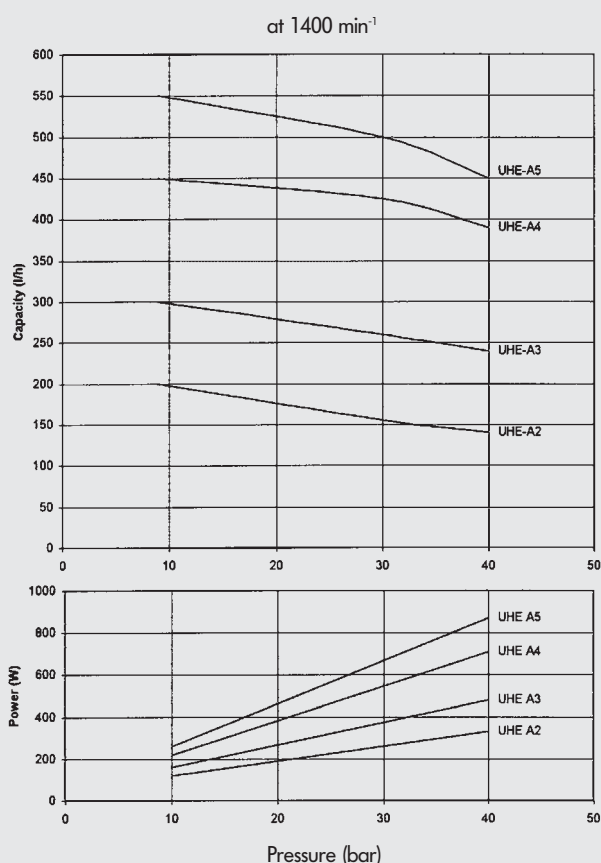
| Pump series<br><b>UHE</b> | Viscosity: 6 mm <sup>2</sup> sec <sup>-1</sup> bei 20 °C |          |           |           |                                             |          |           |           | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection<br>for (S/A/R) | Manometer connection<br>(M1/M2) | Max. allowed pump RPM<br>(min <sup>-1</sup> ) | Net weight<br>(kg) |
|---------------------------|----------------------------------------------------------|----------|-----------|-----------|---------------------------------------------|----------|-----------|-----------|----------------------|------------|------------------------------------|---------------------------------|-----------------------------------------------|--------------------|
|                           | n = 1400 min <sup>-1</sup><br>Discharge l/h              |          |           |           | n = 2800 min <sup>-1</sup><br>Discharge l/h |          |           |           |                      |            |                                    |                                 |                                               |                    |
|                           | Size                                                     | at 9 bar | at 30 bar | at 40 bar | Article-no.<br>I                            | at 9 bar | at 30 bar | at 40 bar |                      |            |                                    |                                 | Article-no.<br>I                              | at I/D             |
| UHE-A2-PZ                 | 200                                                      | 155      | 140       | 0110542   | 500                                         | 380      | 330       | 0130542   | 38                   | 12         | G1/2 "                             | G1/4 "                          | 2800                                          | 4,4                |
| UHE-A3-P                  | 300                                                      | 260      | 240       | 0110543   | 700                                         | 600      | 550       | 0130543   | 38                   | 12         | G1/2 "                             | G1/4 "                          | 2800                                          | 4,6                |
| UHE-A4-M                  | 450                                                      | 425      | 390       | 0110544   | 900                                         | 850      | 800       | 0130544   | 38                   | 12         | G1/2 "                             | G1/4 "                          | 2800                                          | 4,8                |
| UHE-A5-GZ                 | 550                                                      | 500      | 450       | 0110545   | 1300                                        | 1150     | 1050      | 0130545   | 38                   | 12         | G1/2 "                             | G1/4 "                          | 2800                                          | 5,0                |

### hp-Internal gear pumps up to 40 bar (direction of rotation **D** = direct – clockwise)

| Pump series<br><b>UHE</b> | Viscosity: 6 mm² sec <sup>-1</sup> bei 20 °C |           |           |                         |                                             |           |           |                         | Gear rotor size<br>Ø | Shaft<br>Ø | Threaded connection for (S/A/R) | Manometer connection (M1/M2) | Heating capacity H2 in Watt at 230V, 50 Hz | Initial pump breakaway torque (Nm) |
|---------------------------|----------------------------------------------|-----------|-----------|-------------------------|---------------------------------------------|-----------|-----------|-------------------------|----------------------|------------|---------------------------------|------------------------------|--------------------------------------------|------------------------------------|
|                           | n = 1400 min <sup>-1</sup><br>Discharge l/h  |           |           |                         | n = 2800 min <sup>-1</sup><br>Discharge l/h |           |           |                         |                      |            |                                 |                              | at I/D                                     | at I/D                             |
|                           | at 9 bar                                     | at 30 bar | at 40 bar | Article-no.<br><b>D</b> | at 9 bar                                    | at 30 bar | at 40 bar | Article-no.<br><b>D</b> |                      |            |                                 |                              |                                            |                                    |
| Size                      |                                              |           |           |                         |                                             |           |           |                         |                      |            |                                 |                              |                                            |                                    |
| UHE-A2-PZ                 | 200                                          | 155       | 140       | 0120542                 | 500                                         | 380       | 330       | 0140542                 | 38                   | 12         | G1/2 "                          | G1/4 "                       | 110                                        | 1,6                                |
| UHE-A3-P                  | 300                                          | 260       | 240       | 0120543                 | 700                                         | 600       | 550       | 0140543                 | 38                   | 12         | G1/2 "                          | G1/4 "                       | 110                                        | 1,6                                |
| UHE-A4-M                  | 450                                          | 425       | 390       | 0120544                 | 900                                         | 850       | 800       | 0140544                 | 38                   | 12         | G1/2 "                          | G1/4 "                       | 110                                        | 1,6                                |
| UHE-A5-GZ                 | 550                                          | 500       | 450       | 0120545                 | 1300                                        | 1150      | 1050      | 0140545                 | 38                   | 12         | G1/2 "                          | G1/4 "                       | 110                                        | 1,6                                |

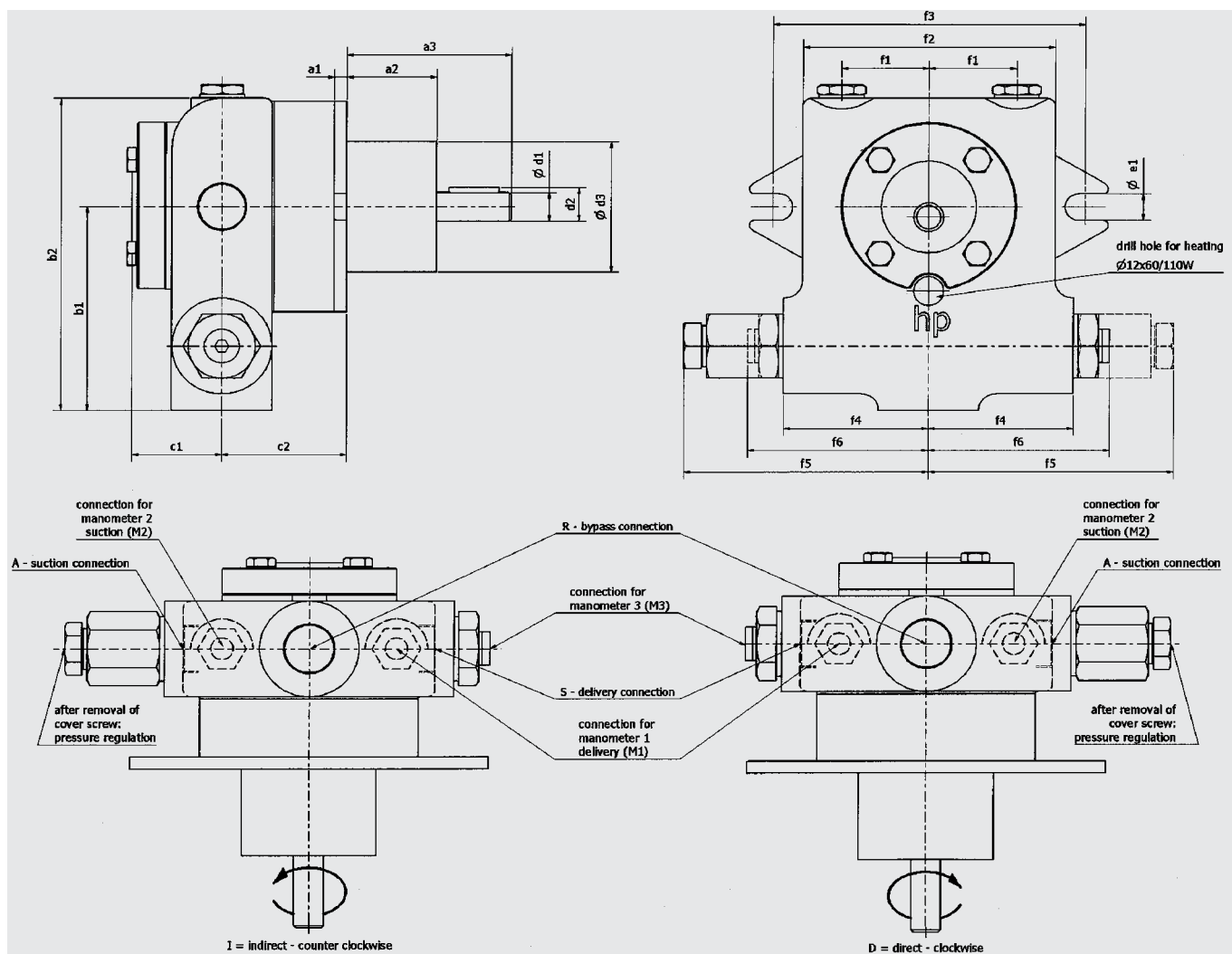
### Characteristics hp-Industrial pumps

Series UHE - AX; for fuel oil L / EL



## Scaled drawings for series UHE

1.5



Pipe connections DIN ISO 228

| Series    | a1 | a2 | a3 | b1 | b2  | c1 | c2 | d1 | d2   | d3 |
|-----------|----|----|----|----|-----|----|----|----|------|----|
| UHE-A2-PZ | 5  | 36 | 66 | 85 | 130 | 36 | 50 | 12 | 13,5 | 54 |
| UHE-A3-P  | 5  | 36 | 66 | 85 | 130 | 36 | 54 | 12 | 13,5 | 54 |
| UHE-A4-M  | 5  | 36 | 66 | 85 | 130 | 36 | 58 | 12 | 13,5 | 54 |
| UHE-A5-GZ | 5  | 36 | 66 | 85 | 130 | 36 | 64 | 12 | 13,5 | 54 |

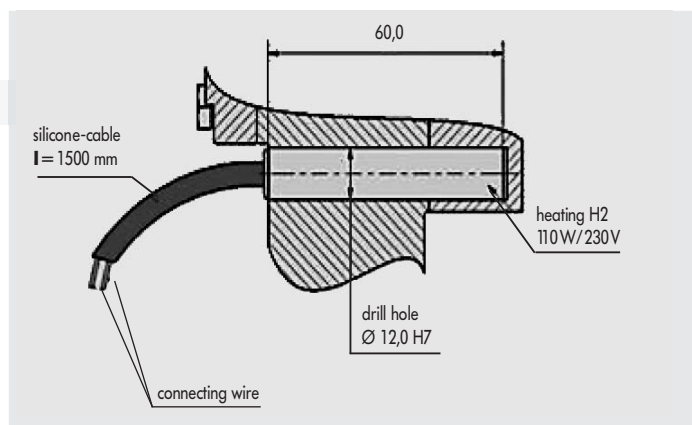
| Series    | e1 | f1 | f2  | f3  | f4 | f5 | f6   | S; A; R | M1; M2 | M3   |
|-----------|----|----|-----|-----|----|----|------|---------|--------|------|
| UHE-A2-PZ | 11 | 35 | 101 | 125 | 58 | 98 | 72,5 | 1/2"    | G1/4"  | 1/8" |
| UHE-A3-P  | 11 | 35 | 101 | 125 | 58 | 98 | 72,5 | 1/2"    | G1/4"  | 1/8" |
| UHE-A4-M  | 11 | 35 | 101 | 125 | 58 | 98 | 72,5 | 1/2"    | G1/4"  | 1/8" |
| UHE-A5-GZ | 11 | 35 | 101 | 125 | 58 | 98 | 72,5 | 1/2"    | G1/4"  | 1/8" |

### Accessories for UHE-series

Axial face seal: see page 18 (gear rotor size Ø 38)

### hp-Electric standby and companion heaters series H2, for hp-Industrial pumps

All hp-Industrial pumps series UHE-AX can be equipped with electric heating, series H2, at the factory.



## Series PON; with integrated overflow valve, bypass, integrated filter 1.6

### Technical selection chart

Direction of rotation **I** = indirect – counterclockwise  
**D** = direct – clockwise

Nozzle port **R** = on the right-hand side  
**L** = on the left-hand side

The direction of rotation can only be changed in the factory. Therefore please assure that you state the desired direction of rotation and the direction of the nozzle port as per the size chart/sheet when ordering!  
 Standard design of the pump for two pipe installation, design for one pipe installation can be changed individually. (See operation installation and maintenance instructions).



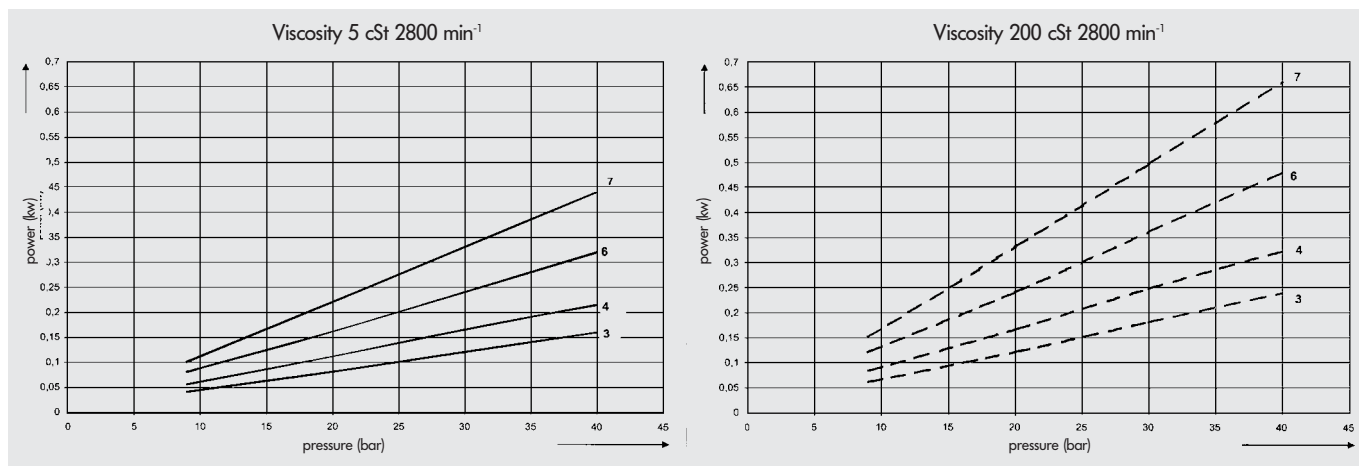
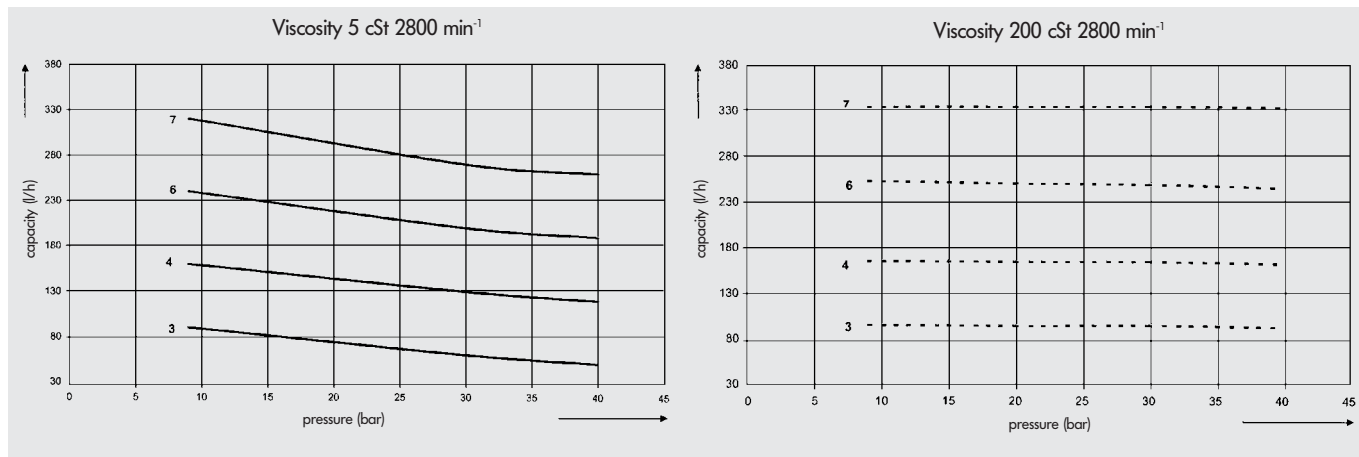
### hp-Internal gear pumps up to 40 bar

| Pump series | Capacity l/h at:<br>n = 2800 min <sup>-1</sup><br>viscosity 5 cSt. |        |        | Direction of rotation          | Nozzle port | Article-no. |         |         |         | Max. allowed pump<br>RPM (min <sup>-1</sup> ) | Gear rotor<br>size Ø | Initial pump<br>breakaway<br>torque | Net weight<br>kg |
|-------------|--------------------------------------------------------------------|--------|--------|--------------------------------|-------------|-------------|---------|---------|---------|-----------------------------------------------|----------------------|-------------------------------------|------------------|
|             | 9 bar                                                              | 30 bar | 40 bar |                                |             | I-L         | I-R     | D-L     | D-R     |                                               |                      |                                     |                  |
| PON 3       | 90                                                                 | 60     | 50     | D = direct-clockwise           | R           | 0130601     | 0130611 | 0140601 | 0140611 | 3600                                          | 25                   | 1,2 Nm                              | 5,0              |
| PON 4       | 160                                                                | 130    | 120    |                                | R           | 0130602     | 0130612 | 0140602 | 0140612 | 3600                                          | 25                   | 1,2 Nm                              |                  |
| PON 6       | 240                                                                | 200    | 190    | I = indirect-counter-clockwise | L           | 0130603     | 0130613 | 0140603 | 0140613 | 3600                                          | 25                   | 1,2 Nm                              |                  |
| PON 7       | 320                                                                | 270    | 260    |                                | L           | 0130604     | 0130614 | 0140604 | 0140614 | 3600                                          | 25                   | 1,2 Nm                              |                  |

| Pump series | Capacity at 9 bar in<br>l/h | Connection |              |        |           | Pressure stage | RPM (min <sup>-1</sup> )   | Medium                         | Accessories                                                                     |
|-------------|-----------------------------|------------|--------------|--------|-----------|----------------|----------------------------|--------------------------------|---------------------------------------------------------------------------------|
|             |                             | Nozzle     | Suction side | Bypass | Manometer |                |                            |                                |                                                                                 |
| PON 3       | 90                          | 1/4"       | 1/2"         | 1/2"   | 1/8"      | 1 = 1-4        | 1 = 1400 min <sup>-1</sup> | 0 = fuel oil EL + L<br>MGO/MDO | H3- heating element PON<br>E- one pipe installation<br>Z- two pipe installation |
| PON 4       | 160                         | 1/4"       | 1/2"         | 1/2"   | 1/8"      | 2 = 2-9        |                            |                                |                                                                                 |
| PON 6       | 240                         | 1/4"       | 1/2"         | 1/2"   | 1/8"      | 3 = 6-25       |                            |                                |                                                                                 |
| PON 7       | 320                         | 1/4"       | 1/2"         | 1/2"   | 1/8"      | 4 = 15-40      | 2 = 2800 min <sup>-1</sup> | 5 = fuel oil M + S             |                                                                                 |

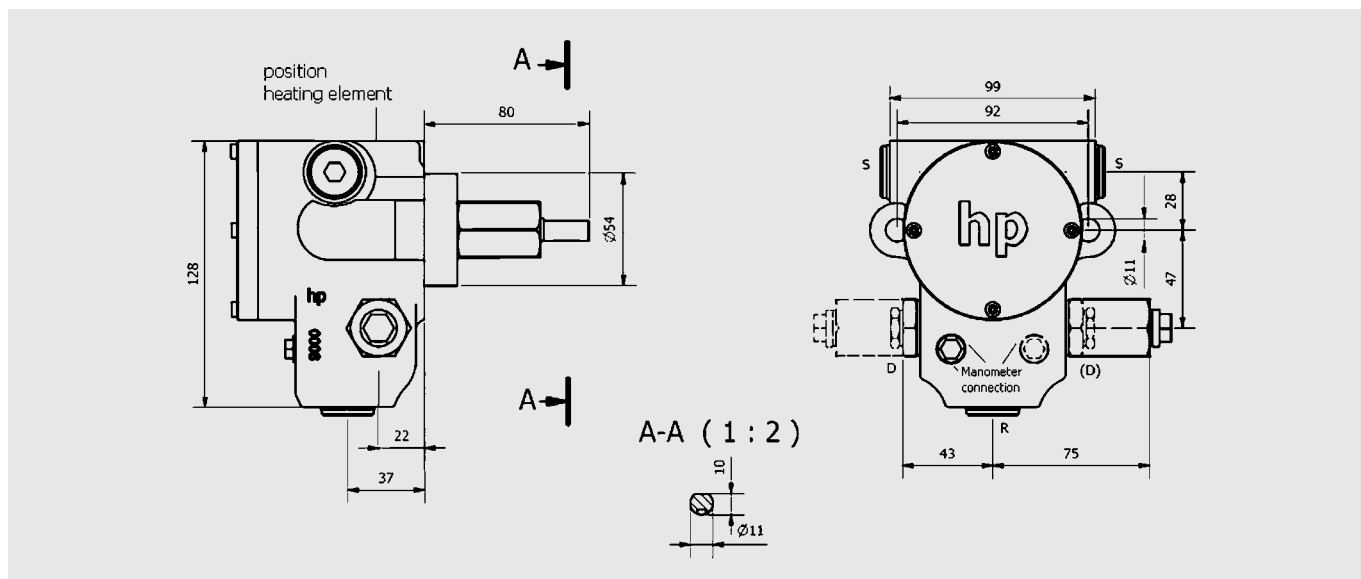
### Characteristics hp-Industrial pumps

Series PON, for viscosity 5 cSt and 200 cSt



**Scaled drawings for series PON**

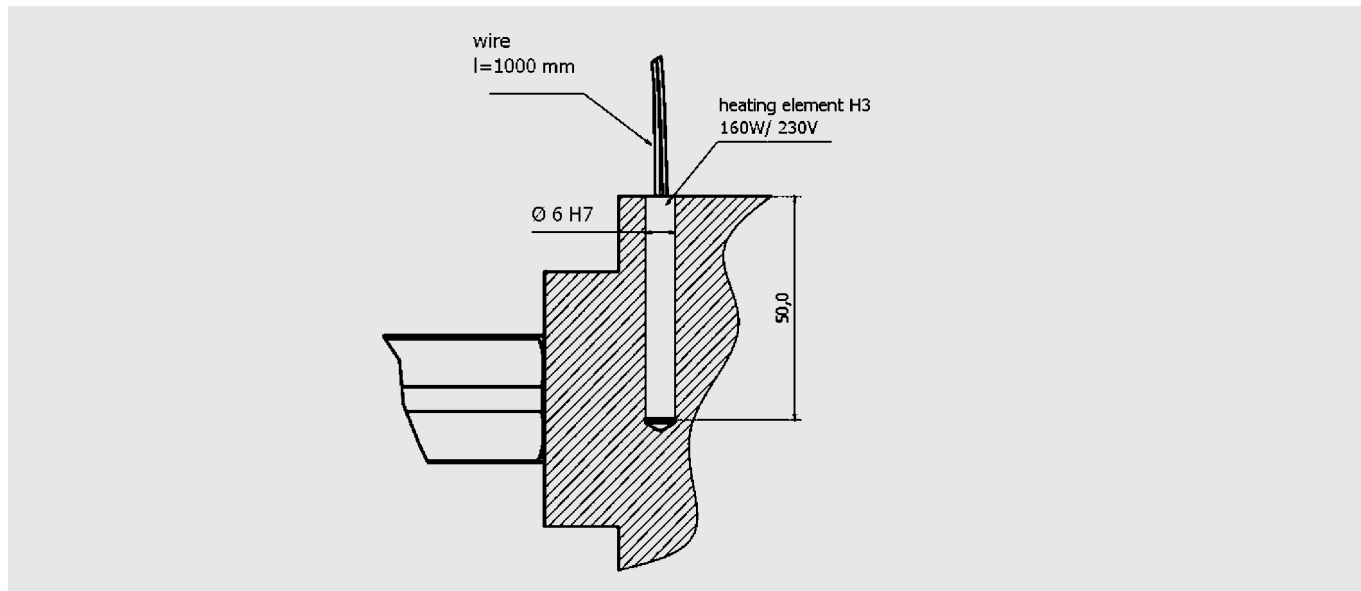
**1.6**



Pipe connections cyl. with worth pipe threading DIN ISO 228

**hp-Electric standby and companion heaters series H3 for hp-Oilburnerpumps series PON**

All hp-Oilburnerpumps series PON can be equipped with electric heating, series H3, at the factory.

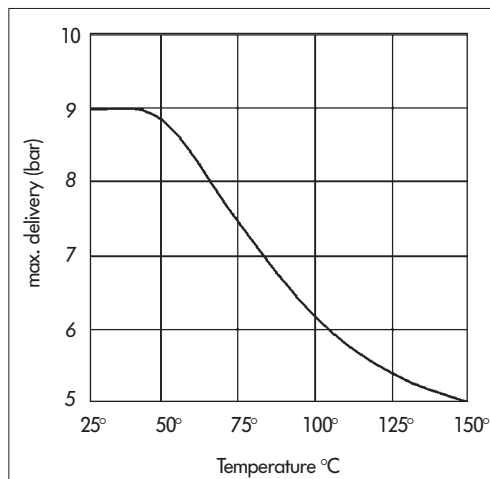


## hp-Pump accessories

1.7

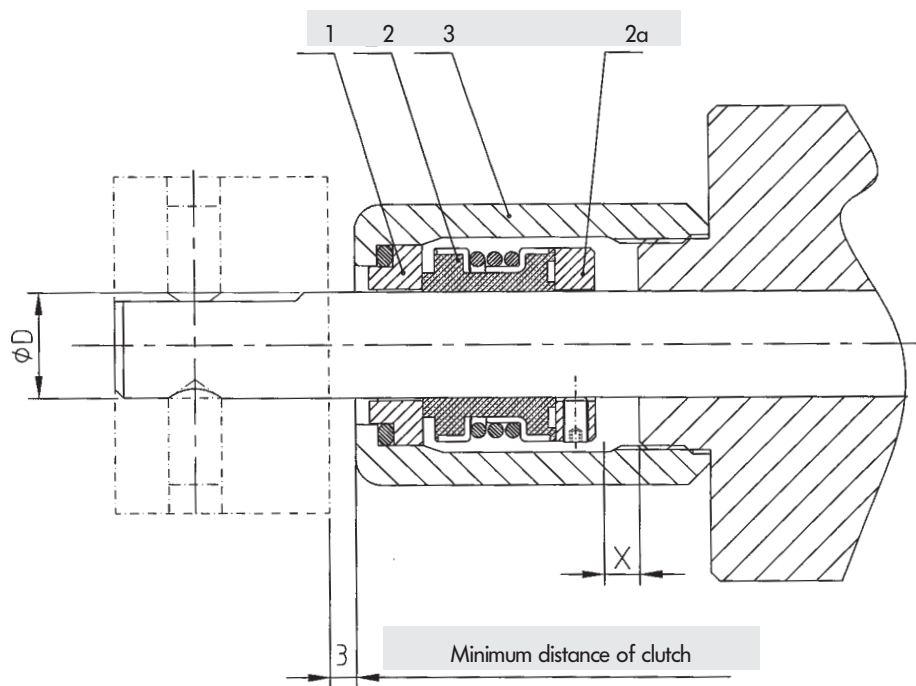
All hp pumps are equipped with axial face seals made of viton which can resist pressures of up to 5 bar and with stand temperatures of up to 150 °C.

The axial face seals are relieved of pressure on the suction side of the pump. See graph for maximum pressure load of the axial face seal, i.e. of the suction side in dependance with the temperature.



### Product number for axial face seal

| Gear rotor size Ø | Shaft Ø | Viton (max. 150 °C)<br>spare part article-no. |
|-------------------|---------|-----------------------------------------------|
| 25                | 12      | 0190015                                       |
| 38                | 12      | 0190015                                       |
| 56                | 18      | 0190016                                       |
| 75                | 22      | 0190017                                       |

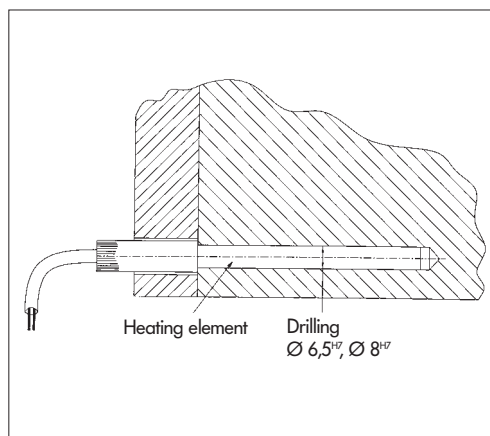


- 1 = mating ring
- 2 = shaft seal
- 2a = tension ring
- 3 = coupling ring

### hp-Electric standby and companion heaters for type H1 – hp-Industrial pump

All hp pump models can be equipped with electric heating, type H1, at the factory.

| Equipped at factory:<br>Article-no. H1 | Spare part<br>Article-no. H1 | Suitable for pumps<br>with a motive<br>force diameter of: | Shaft<br>Ø | Heating<br>capacity<br>[W] | Number of<br>heating cartridges<br>230 V, 50 Hz,<br>other voltages<br>available upon request |
|----------------------------------------|------------------------------|-----------------------------------------------------------|------------|----------------------------|----------------------------------------------------------------------------------------------|
| 0190050                                | 0190055                      | 25                                                        | 12         | 100                        | 1                                                                                            |
| 0190051                                | 0190056                      | 38                                                        | 12         | 100                        | 1                                                                                            |
| 0190052                                | 0190057                      | 56                                                        | 18         | 160                        | 1                                                                                            |
| 0190053                                | 0190058                      | 75                                                        | 22         | 280                        | 1                                                                                            |



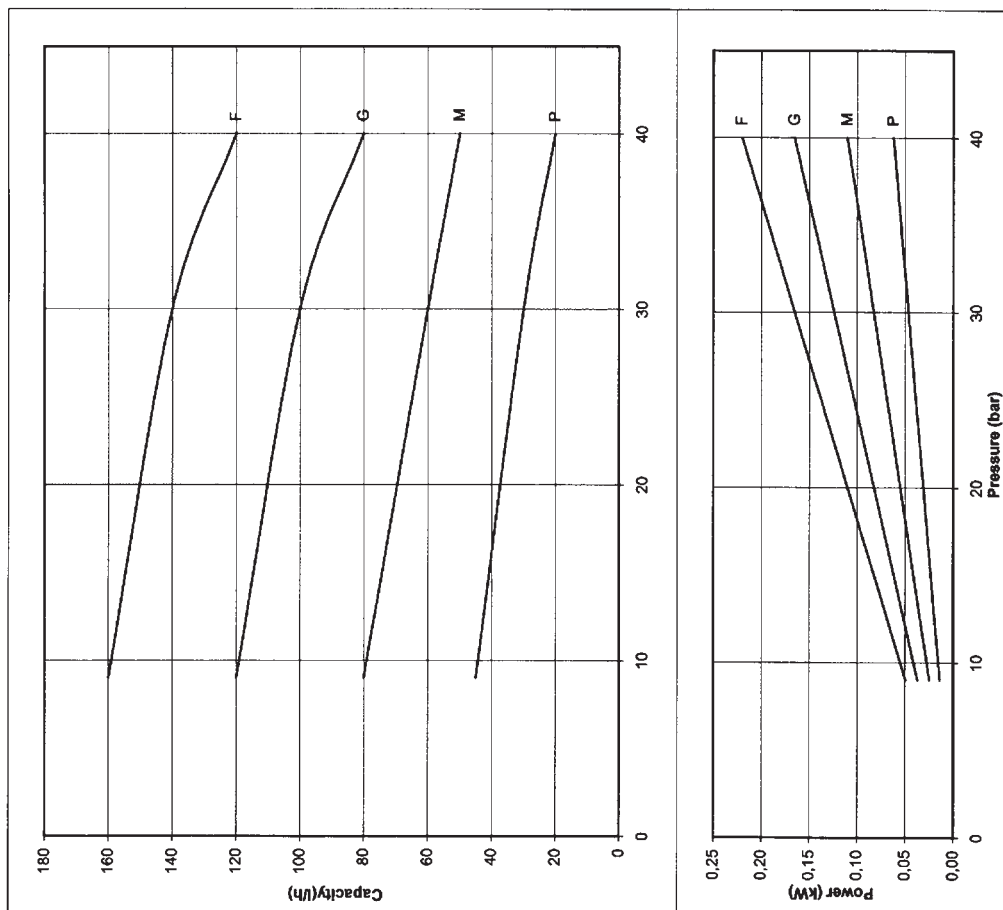


**Discharge graphs for hp-Industrial pumps**

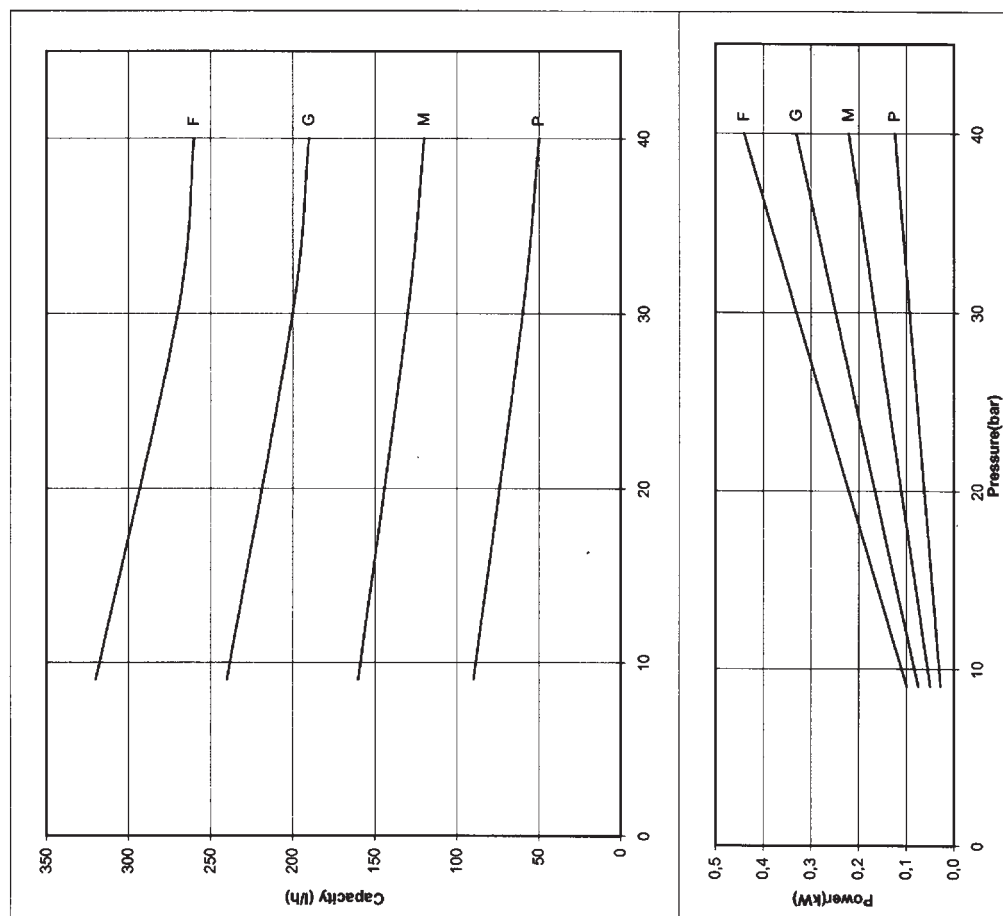
**1.8**

**Characteristics hp-Industrial pumps • Gear rotor size-Ø 25; for fuel oil L/EL**

at 1400 min<sup>-1</sup>



at 2800 min<sup>-1</sup>

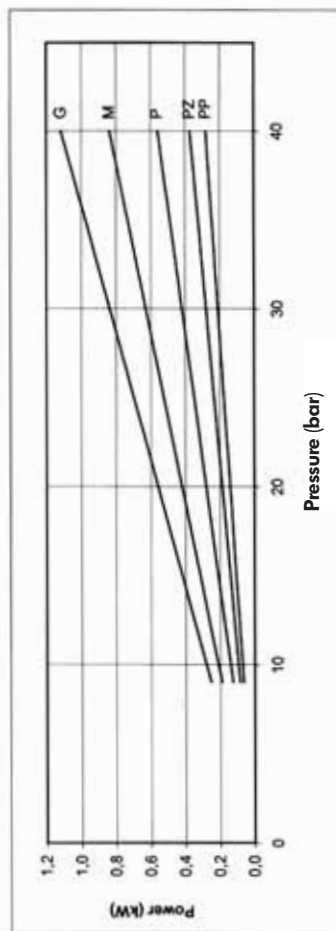
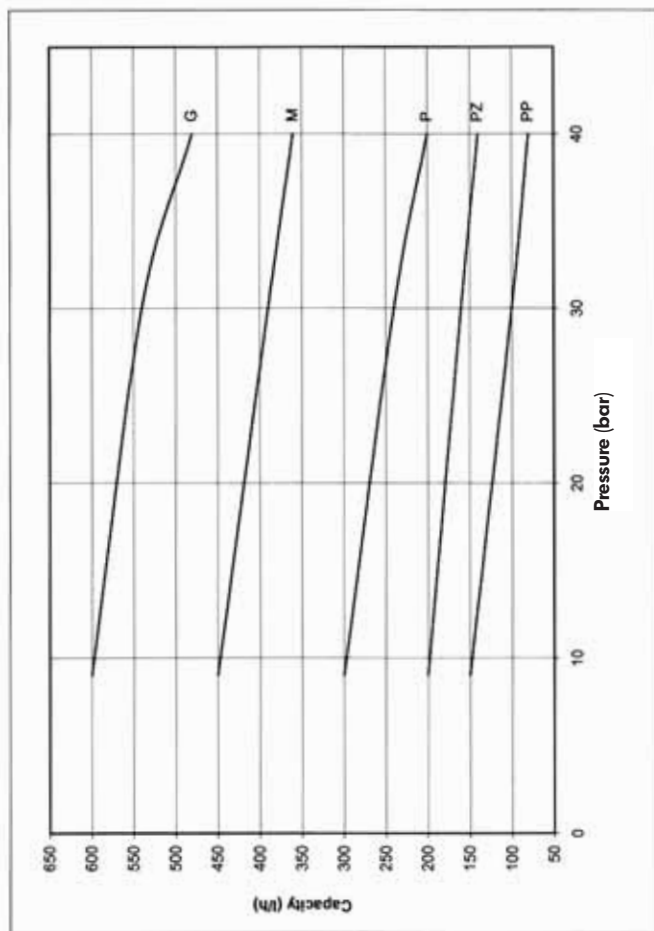


**Discharge graphs for hp-Industrial pumps**

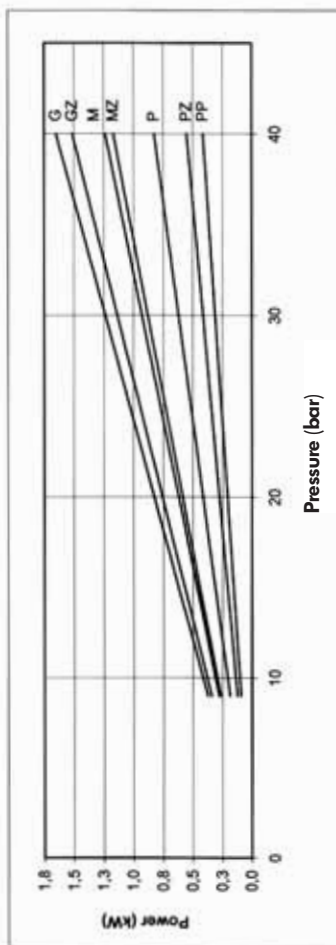
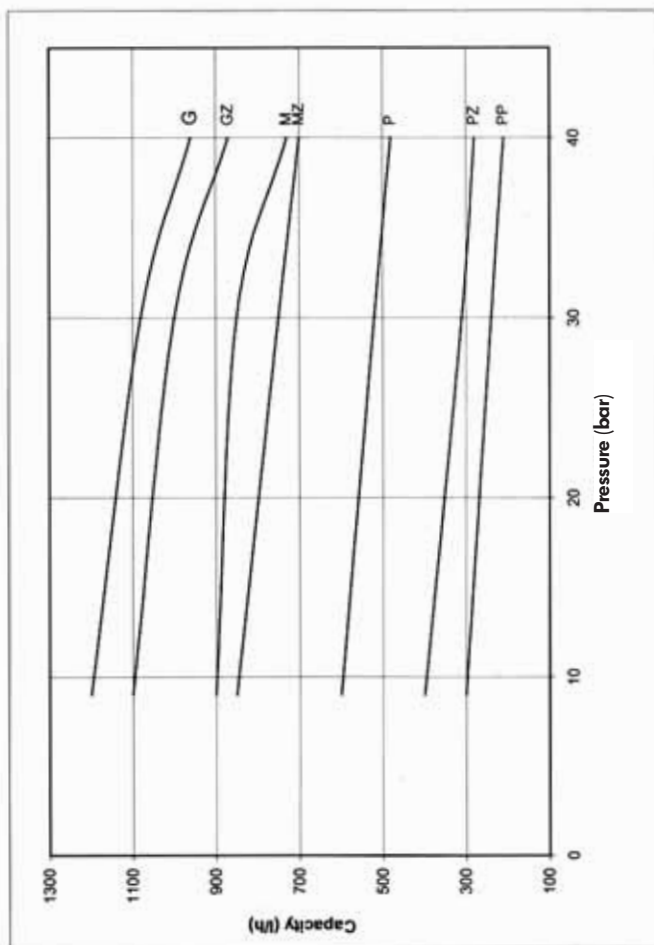
**1.8**

Characteristics hp-Industrial pumps • Gear rotor size-Ø 38; for fuel oil L/EL

at 1400 min<sup>-1</sup>



at 2800 min<sup>-1</sup>

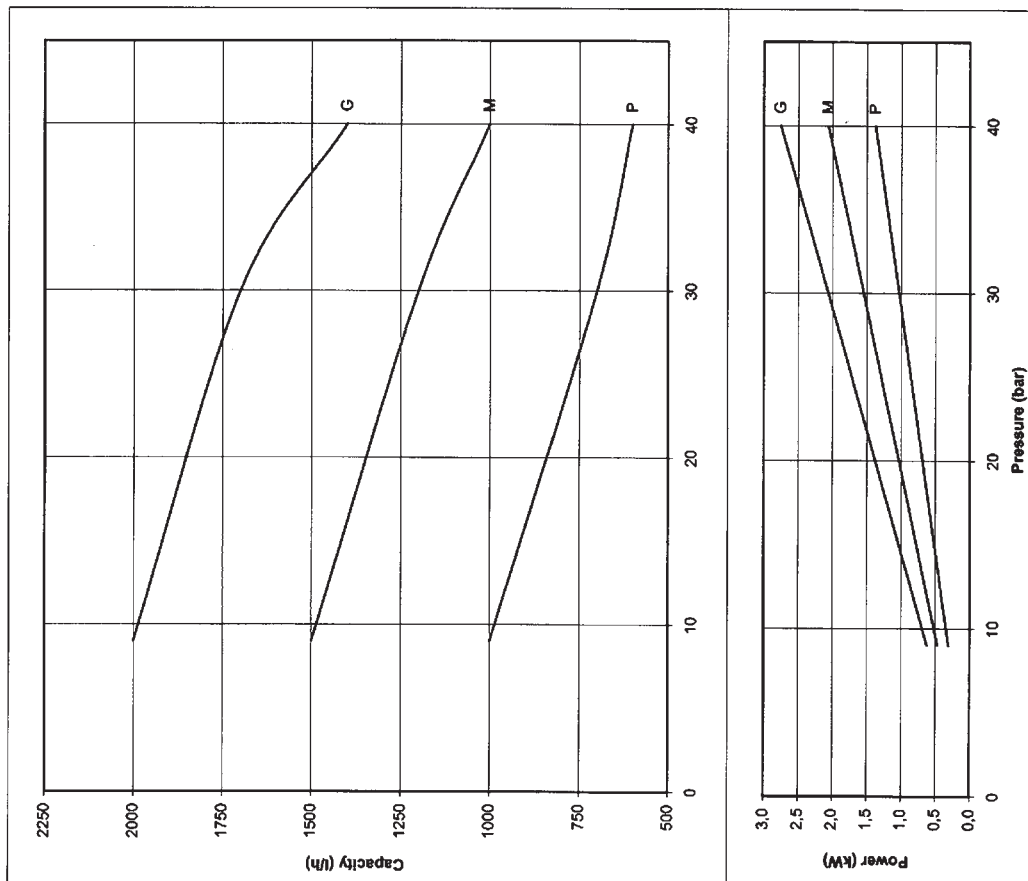


**Discharge graphs for hp-Industrial pumps**

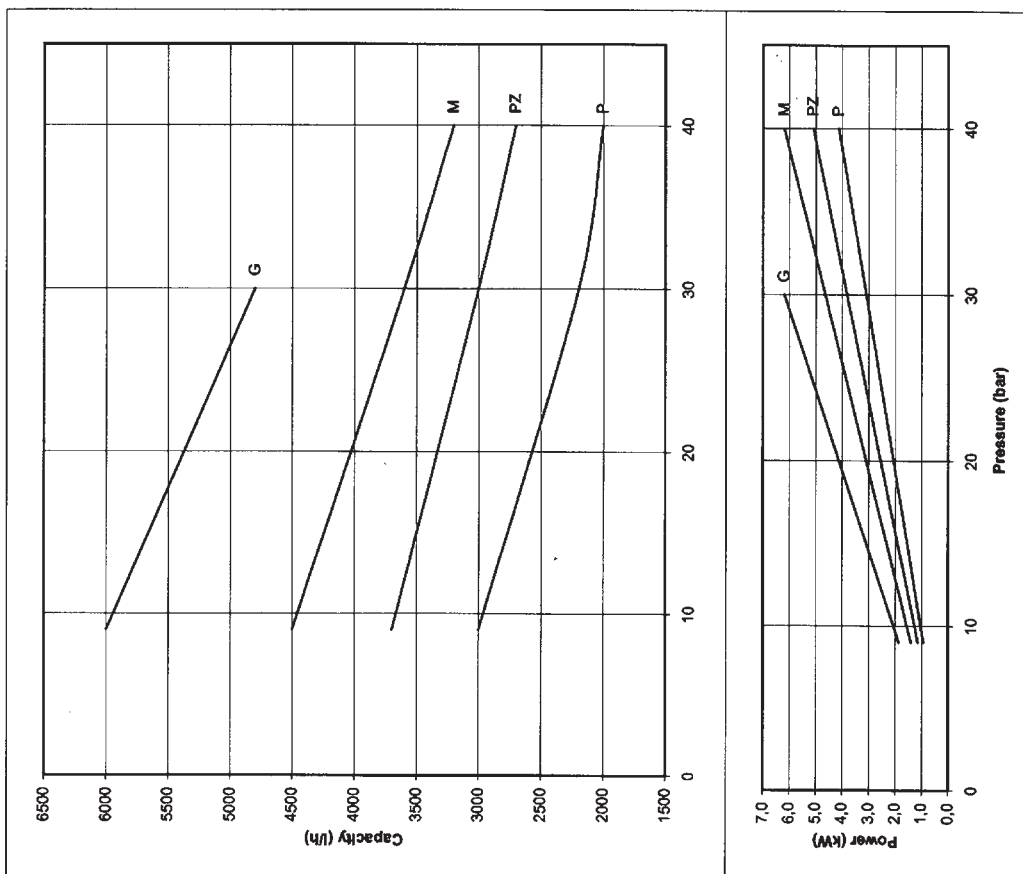
**1.8**

**Characteristics hp-Industrial pumps for fuel oil L/EL**

Gear rotor size-Ø 56 at 1400 min<sup>-1</sup>



Gear rotor size-Ø 75 at 1400 min<sup>-1</sup>



## Overflow valve program

2.0

### hp-Overflow valves



#### Overflow valves

Thread connection

Flange connection

Flange connection with modulating kit

Flange connection for SAE connection

#### Regulating valves

Flow regulating valve

## hp-Overflow valves with thread connection

2.1

### Mode of operation E; with adjustment screw

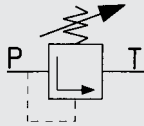
For lubricating and hydraulic oils and many other self-lubricating, non-corrosive fluids.

Maximum temperature of delivery fluid: 150 °C.

Material: casing of hydraulic cast iron GGG 40.

Piston, valve tip, spring of hardened steel.

**Action: directly controlled, spring-loaded overflow valve to maintain a set operating pressure or a set maximum pressure.**



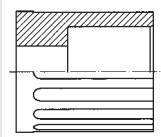
Summary:  
hp overflow valve,  
flow rate: ..... (l/h)  
pressure range: ....., adjustable: ..... (bar)  
type: .....

| Type                       | Pressure stage for type (Article-no.)                                                    | Connection-thread <sup>1)</sup> | Flow rate <sup>2)</sup> l/h | Viscosity stage <sup>2)</sup> cSt | Article-no. |
|----------------------------|------------------------------------------------------------------------------------------|---------------------------------|-----------------------------|-----------------------------------|-------------|
| B - PP - E -               | 0 = 0,5 - 1,5 bar<br>1 = 1 - 4 bar<br>2 = 2 - 9 bar<br>3 = 6 - 25 bar<br>4 = 15 - 40 bar | G 1/4"                          | 6 - 120                     | 2,8 to 480                        | 0210001     |
| B - P - E -                |                                                                                          | G 3/8"                          | 15 - 160                    | 2,8 to 480                        | 0210002     |
| B - G - E -                |                                                                                          | G 1/2"                          | 30 - 600                    | 2,8 to 480                        | 0210003     |
| B - GH - E - <sup>3)</sup> |                                                                                          | G 3/4"                          | 100 - 2000                  | 2,8 to 480                        | 0210004     |
| B - GHG - E -              |                                                                                          | G 1"                            | 300 - 6000                  | 2,8 to 480                        | 0210005     |
| B - GHG - R 1 1/4" - E -   |                                                                                          | G 1 1/4"                        | 500 - 10000                 | 2,8 to 480                        | 0210006     |

1) Cyl. with worth pipe threading G...A DIN ISO 228

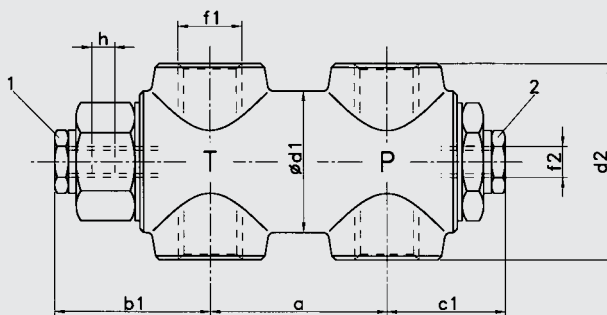
2) Performance curve on page 24-26.

3) No pressure stage 0, instead 1: 0.5 - 3.5 bar. Refer to chart for all other pressure stages.



For very dirty heavy oils the overflow valve may be equipped / sublemented with a piston with axial nut (heavy oil piston) at an additional cost.

| Type               | Article-no. | Ø/Drilling |
|--------------------|-------------|------------|
| BP                 | 0840750     | 20/2,5     |
| BG/FDR 15          | 0840752     | 20/5,0     |
| BG/FDR 15          | 0840754     | 20/7,5     |
| BHG/FDR 20         | 0840756     | 30/10      |
| BGHG 1"/FDR 25     | 0840758     | 35/15      |
| BGHG 1 1/4"/FDR 32 | 0840760     | 35/25      |



### Model equipped with regulating screw

Turning the pressure regulating screw to the right (clockwise) with a hexagon screwdriver will increase the pressure and turning it to the left (counterclockwise) will reduce the pressure.

### Size chart

| Type         | a  | b1 | c1 | d1 | d2 | f1       | Max. pipe | NW | f2     | Adjustable range h at stage: |    |   |   |
|--------------|----|----|----|----|----|----------|-----------|----|--------|------------------------------|----|---|---|
| PP           | 44 | 36 | 34 | 26 | 40 | G 1/4"   | 10 x 1    | 8  | G 1/8" | 0 + 1                        | 2  | 3 | 4 |
| P            | 55 | 51 | 37 | 36 | 52 | G 3/8"   | 12 x 1    | 10 | G 1/8" | 15                           | 12 | 8 | 7 |
| G            | 55 | 51 | 37 | 36 | 52 | G 1/2"   | 18 x 1,5  | 15 | G 1/8" | 15                           | 12 | 8 | 7 |
| GH           | 63 | 57 | 43 | 50 | 70 | G 3/4"   | 22 x 1,5  | 20 | G 1/4" | 15                           | 10 | 8 | 5 |
| GHG          | 80 | 71 | 60 | 56 | 86 | G 1"     | 28 x 1,5  | 25 | G 1/4" | 20                           | 17 | 9 | 6 |
| GHG - 1 1/4" | 80 | 71 | 60 | 56 | 86 | G 1 1/4" | 35 x 2    | 30 | G 1/4" | 20                           | 17 | 9 | 6 |

For assembly, start-up and maintenance, please adhere to the instruction manual that comes with each device!

## hp-Overflow valve with flange connection

2.2

### Mode of operation E: with adjustment screw

For lubricating and hydraulic oils and many other self-lubricating, non-corrosive fluids. Fuel oil EL, L, M, S und ES, kerosine.

Maximum temperature of delivery fluid: 150° C

Material: casing of hydraulic cast iron GGG 40.

Piston, valve tip, spring of hardened steel.

**Action: directly controlled, spring-loaded overflow valve to maintain a set operating pressure or a set maximum pressure.**

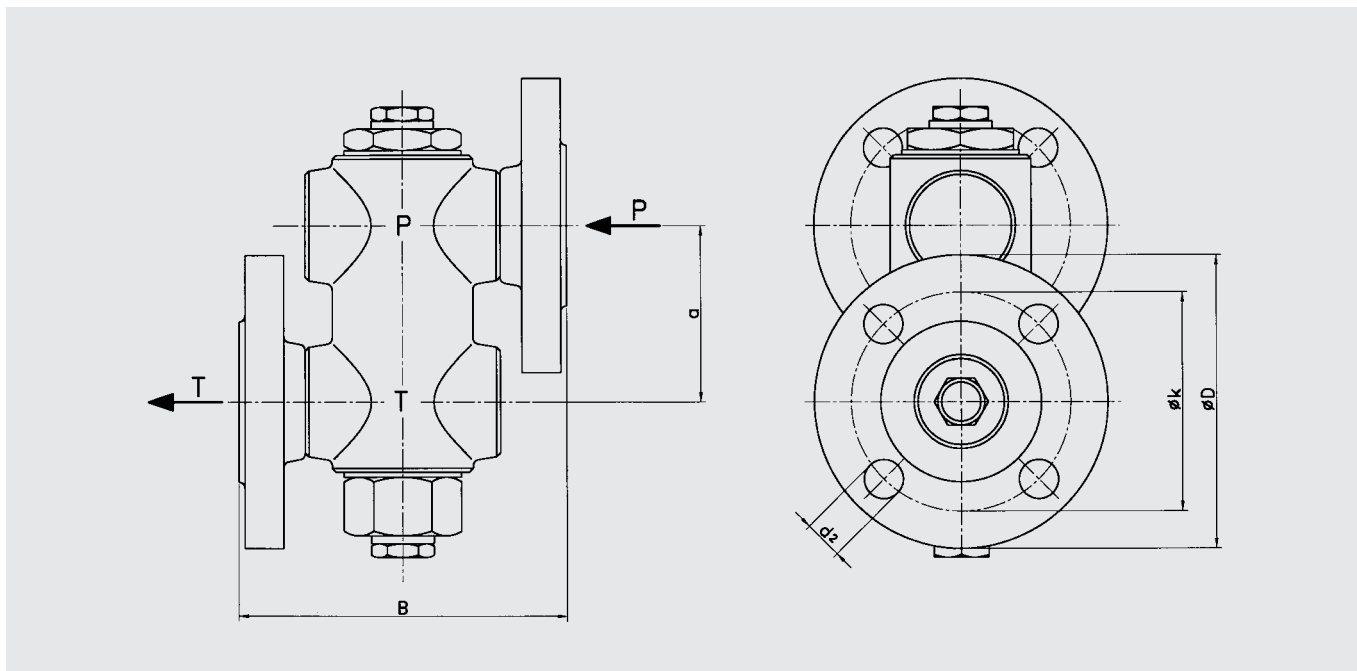


| Type                     | Pressure stage for type<br>(Article-no.) | Flange<br>DIN 2635 PN 40 | Flow rate <sup>2)</sup><br>l/h | Viscosity stage <sup>2)</sup><br>cSt | Article-no. |
|--------------------------|------------------------------------------|--------------------------|--------------------------------|--------------------------------------|-------------|
| FDR 15 - E               | 0 = 0,5 - 1,5 bar                        | DN 15 <sup>1)</sup>      | 30 - 600                       | 2,8 to 480                           | 0270001     |
| FDR 20 - E               | 1 = 1 - 4 bar                            | DN 20 <sup>1)</sup>      | 100 - 2000                     | 2,8 to 480                           | 0270002     |
| FDR 25 - E               | 2 = 2 - 9 bar                            | DN 25 <sup>1)</sup>      | 300 - 6000                     | 2,8 to 480                           | 0270003     |
| FDR 32 - E               | 3 = 6 - 25 bar                           | DN 32 <sup>1)</sup>      | 500 - 10000                    | 2,8 to 480                           | 0270004     |
| FDR 50 - E <sup>3)</sup> | 4 = 15 - 40 bar                          | DN 50                    | 8000 - 20000                   | 2,8 to 480                           | 0270006     |

1) Counter flange with seal + screws must be ordered separately

2) Performance curve on page 29-31

3) Only with: pressure stage 1: 1 - 4 bar  
pressure stage 2: 2 - 9 bar  
pressure stage 4: 6 - 40 bar



### Size chart

| Type   | a   | b   | DIN-Flange<br>DIN 2635 | Ø D | Ø k | Ø d <sub>2</sub> | Suitable counter<br>flanges for<br>PN 10 - 40<br>as<br>DIN 2632-35 |
|--------|-----|-----|------------------------|-----|-----|------------------|--------------------------------------------------------------------|
| FDR 15 | 55  | 92  | DN 15                  | 95  | 65  | 14               |                                                                    |
| FDR 20 | 63  | 118 | DN 20                  | 105 | 75  | 14               |                                                                    |
| FDR 25 | 80  | 134 | DN 25                  | 115 | 85  | 14               |                                                                    |
| FDR 32 | 80  | 138 | DN 32                  | 140 | 100 | 18               |                                                                    |
| FDR 50 | 140 | 205 | DN 50                  | 165 | 125 | 18               |                                                                    |

For assembly, start-up and maintenance, please adhere to the instruction manual that comes with each device!



## Pressure regulating valve with modulating kit

2.3

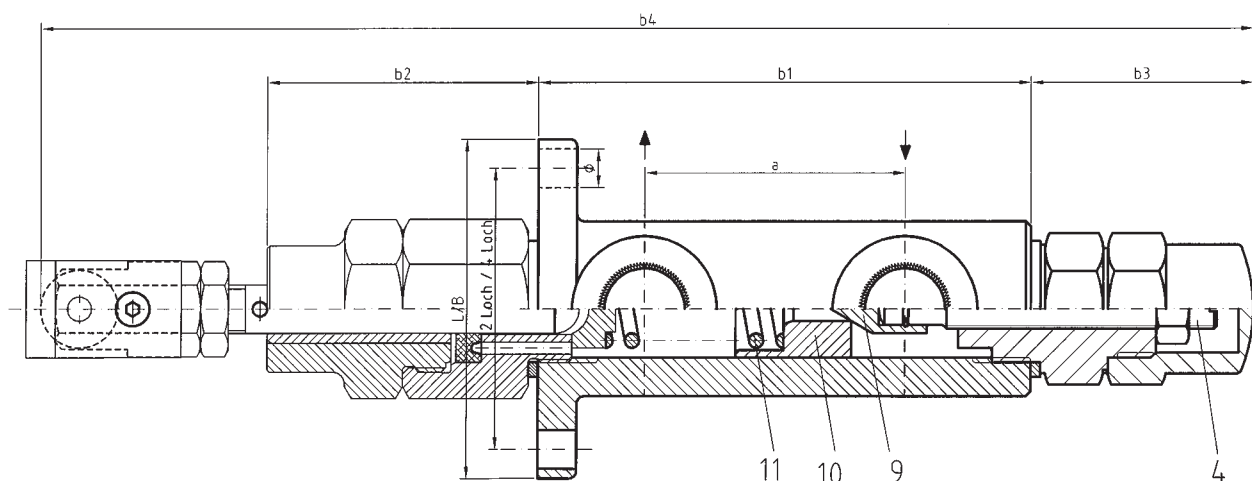
Usage: modulating kit

The regulating valve is used to adjust the oil flow at the backflow of the burner unit. This is needed to ensure the proper nozzle flow and burner output required.

Material: Casing of hydraulic cast iron GGG 40



| Type      | Pressure stage | Connection | Flow rate l/h | Viscosity stage cSt | Article-no. | Weight kg | For fuel oil |
|-----------|----------------|------------|---------------|---------------------|-------------|-----------|--------------|
| DRV 18 EL | 2 = 2-18 bar   | G 3/8"     | 300-600       | 2,8 to 480          | 025 0202    | 1,5       | EL           |
| DRV 19 EL |                | G 3/4"     | 1000-2000     | 2,8 to 480          | 025 0206    | 3         | EL           |
| DRV 21 S  | 3 = 15-25 bar  | G 3/8"     | 300-600       | 2,8 to 480          | 025 0210    | 1,5       | S            |
| DRV 22 S  |                | G 3/4"     | 1000-2000     | 2,8 to 480          | 025 0214    | 3         | S            |



### Pressure

Turning the pressure regulating screw to the right (clockwise) with a screwdriver will increase the pressure and turning it to the left (counterclockwise) will reduce the pressure.

Description: **4** Regulating screw | **9** Valve Cone | **10** Piston | **11** Spring

| Size chart       | a  | b1  | b2 | b3 | b4  | Flange connection measurement |    |               |              |   |
|------------------|----|-----|----|----|-----|-------------------------------|----|---------------|--------------|---|
|                  |    |     |    |    |     | L                             | B  | Hole pattern  | Hole pattern | Ø |
| DRV 18 EL + 21 S | 54 | 102 | 56 | 46 | 250 | 70                            | 48 | 58<br>54 x 30 | 2<br>4       | 8 |
| DRV 19 EL + 22 S | 63 | 119 | 76 | 46 | 300 | 70                            | 70 | 54 x 54       | 4            | 8 |

## hp-Overflow valve with flange connection for SAE connection

2.4

### Mode of operation E; with adjustment screw

For lubricating and hydraulic oils and many other self-lubricating, non-corrosive fluids.

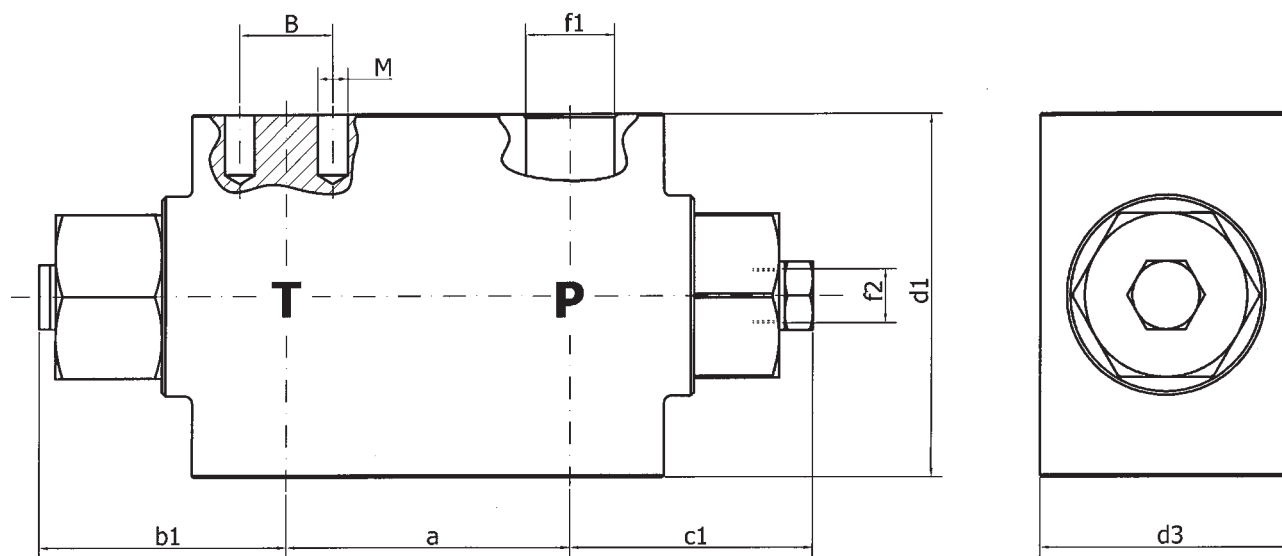
Maximum temperature of delivery fluid: 150° C.

Material: casing of hydraulic cast iron GGG 40 with certificate 3.1 B  
Piston, valve tip, spring of hardened steel.

**Action: directly controlled,  
spring-loaded overflow valve to maintain  
a set operating pressure or a set maximum pressure.**



| Type                  | Pressure stage  | SAE-Flange connection | Flow rate l/h | Viscosity stage cSt | Article-no. | Weight kg |
|-----------------------|-----------------|-----------------------|---------------|---------------------|-------------|-----------|
| B - G - E - SAE 1/2"  | 2 = 2 - 9 bar   | G 1/2"                | 30 - 600      | 2,8 to 480          | 027 0210    | 2,30      |
| B - GH - E - SAE 3/4" | 3 = 15 - 25 bar | G 3/4"                | 100 - 2000    | 2,8 to 480          | 027 0220    | 4,10      |
| B - GHG - E - SAE 1"  | 4 = 15 - 40 bar | G 1"                  | 300 - 6000    | 2,8 to 480          | 027 0230    | 6,30      |



### Model equipped with regulating screw

Turning the pressure regulating screw to the right (clockwise) with a hexagon screwdriver will increase the pressure and turning it to the left (counterclockwise) will reduce the pressure.

| Size chart         | a  | b1 | c1 | d1  | d3 | f1   | f2    | SAE               |      |      |      |
|--------------------|----|----|----|-----|----|------|-------|-------------------|------|------|------|
|                    |    |    |    |     |    |      |       | Flange connection |      |      |      |
| Size               |    |    |    |     |    |      |       | Size              | A    | B    | M    |
| BG - E - SAE 1/2"  | 55 | 51 | 37 | 68  | 54 | Ø 13 | G1/4" | 1/2"              | 38,1 | 17,5 | M 8  |
| BGH - E - SAE 3/4" | 63 | 57 | 43 | 88  | 65 | Ø 19 | G1/4" | 3/4"              | 47,6 | 22,2 | M 10 |
| BGH - E - SAE 1"   | 80 | 69 | 68 | 102 | 68 | Ø 25 | G1/4" | 1"                | 52,4 | 26,2 | M 10 |

## hp-Pressure regulating valve, type BV

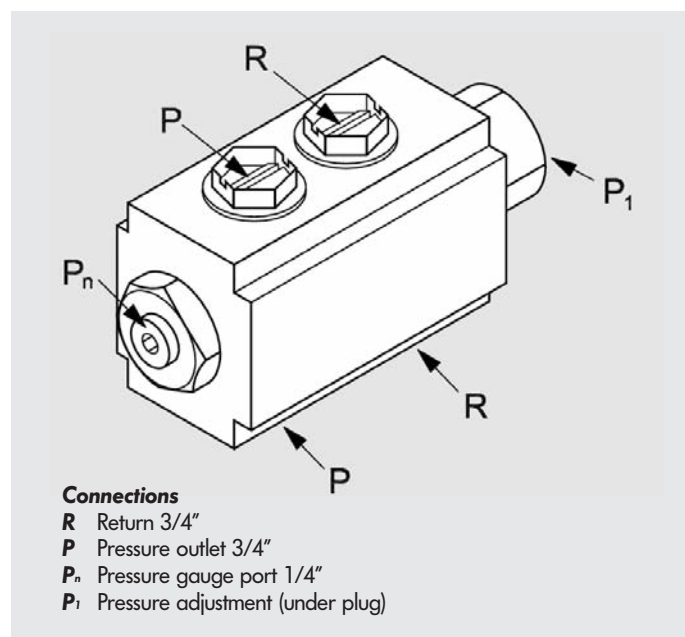
2.5

### Type BV

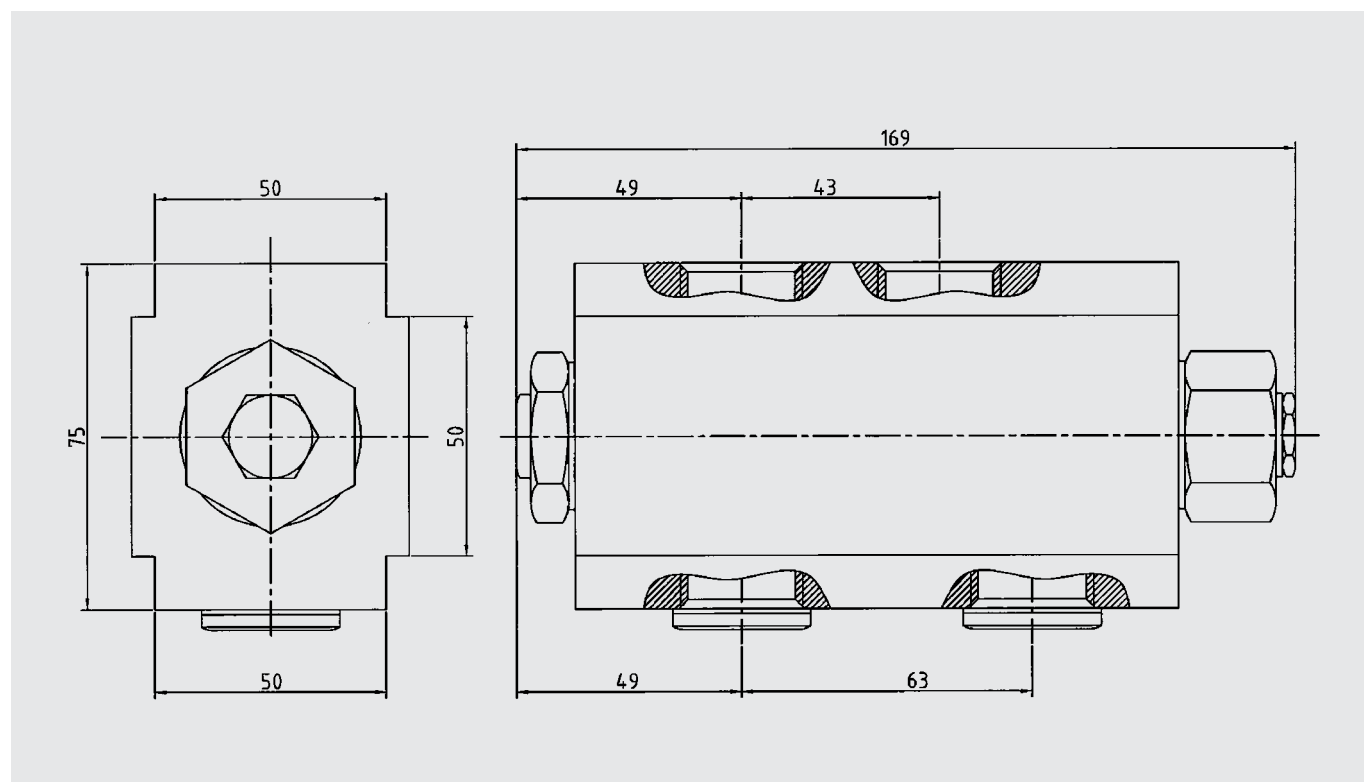
The BV-valve operates in the same way as a pressure relief valve. Oil is led to the supply side P and the spring/piston V ensures constant pressure by leading the oil through the hole in piston to return side R. The system pressure can be adjusted on the setting screw  $P_1$  (under plug).

#### Application and features

- Design in GGG 40 cast iron in accordance with the certification authorities
- Light and heavy oil
- Hydraulic and lubricating oil



| BV-valve                                    |                           |                    |
|---------------------------------------------|---------------------------|--------------------|
| Viscosity stage (measured in suction inlet) | cSt. (mm <sup>2</sup> /s) | 1.3-700            |
| Flow rate                                   | l/h                       | 300-2000           |
| Pressure stages                             | bar                       | 2-9 / 6-25 / 15-40 |
| Factory setting                             | bar                       | Min. pressure      |
| Weight                                      |                           | 3,8 kg             |
| Max. oil temperature                        | °C                        | 180                |
| Ambient temperature                         | °C                        | -10 to +90         |
| Storage temperature                         | °C                        | -20 to +60         |



## hp-Pressure and flow regulating valve, type B-PRO

2.6

### Type B-Pro

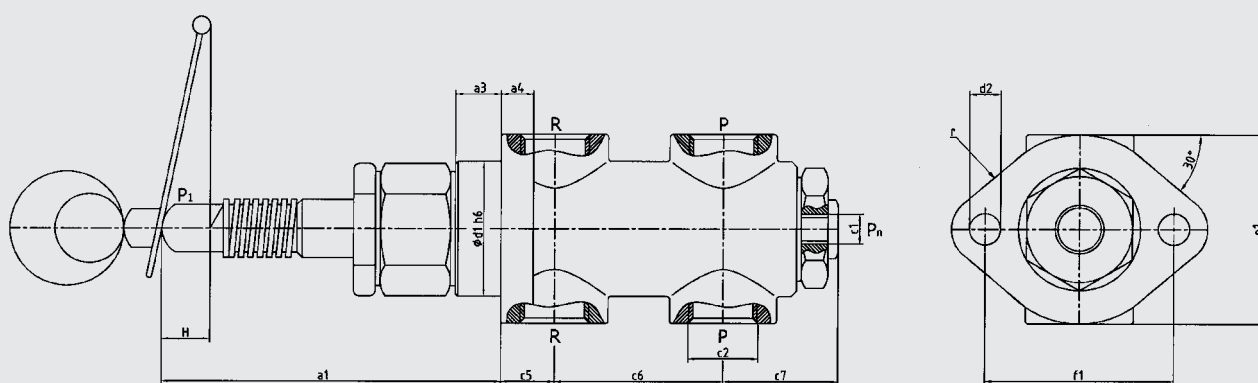
B-PRO-valves are designed to control pressure and flow. They are available in 4 sizes with capacities up to 2000 l/h. B-PRO-valves are typically used in connection with spill-back nozzles where pressure and flow in the return line determine the nozzle capacity.



| B-PRO                                       | Size                      | B-PP-PRO      | B-P-PRO | B-G-PRO | B-GH-PRO |
|---------------------------------------------|---------------------------|---------------|---------|---------|----------|
| Viscosity stage (measured in suction inlet) | cSt. (mm <sup>2</sup> /s) | 1.3-700       |         |         |          |
| Pressure stages                             | bar                       | 2-22 or 5-45  |         |         |          |
| Factory setting                             | bar                       | Min. pressure |         |         |          |
| Weight                                      | kg                        | 0.6           | 1.2     | 1.2     | 2.6      |
| Max. oil temperature                        | °C                        | 180           |         |         |          |
| Ambient temperature                         | °C                        | -10 to +90    |         |         |          |
| Storage temperature                         | °C                        | -20 to +60    |         |         |          |

### Capacity

| Type     | Minimum in l/h | Nominal in l/h | Maximum in l/h |
|----------|----------------|----------------|----------------|
| B-PP-PRO | 20             | 60             | 120            |
| B-P-PRO  | 45             | 160            | 300            |
| B-G-PRO  | 90             | 300            | 600            |
| B-GH-PRO | 300            | 1000           | 2000           |



#### Connections

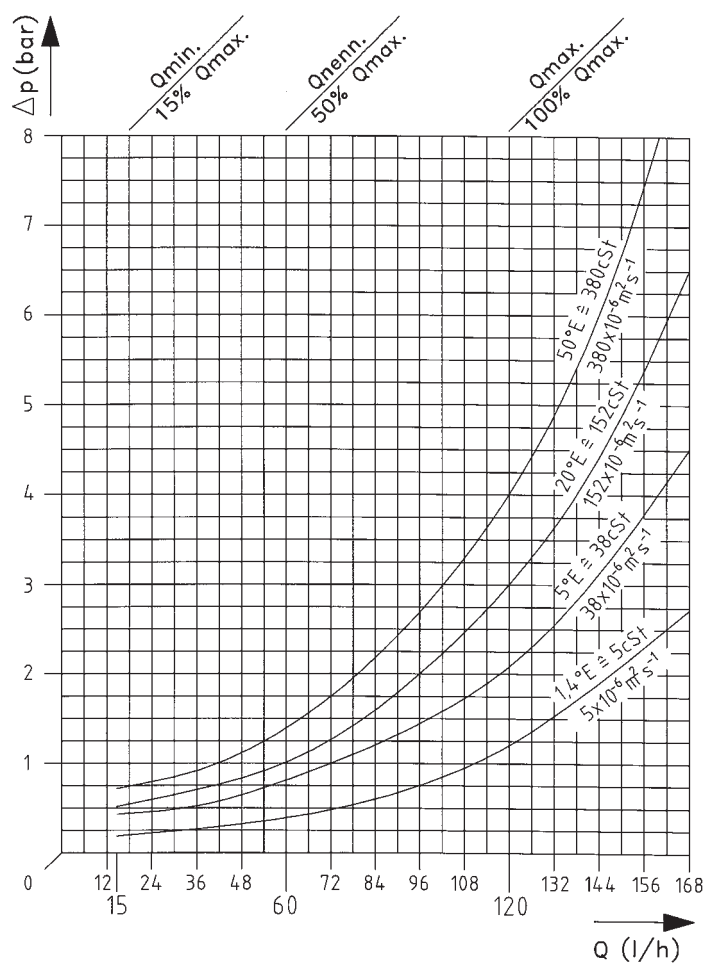
- R** Return to tank
- P** Pressure outlet
- P<sub>n</sub>** Pressure gauge port
- P<sub>1</sub>** Pressure and flow setting

| Type     | a1  | a3 | a4 | c1    | c2    | c5 | c6 | c7 | d1 | d2  | e1 | f1 | H  | r    |
|----------|-----|----|----|-------|-------|----|----|----|----|-----|----|----|----|------|
| B-PP-PRO | 73  | 10 | 8  | R1/8" | R1/4" | 12 | 43 | 34 | 26 | 5.5 | 40 | 40 | 6  | 8    |
| B-P-PRO  | 90  | 12 | 10 | R1/8" | R3/8" | 15 | 65 | 37 | 32 | 6.2 | 55 | 51 | 10 | 8    |
| B-G-PRO  | 90  | 12 | 10 | R1/8" | R3/8" | 15 | 65 | 37 | 32 | 6.2 | 55 | 51 | 10 | 8    |
| B-GH-PRO | 121 | 17 | 12 | R1/4" | R3/4" | 20 | 63 | 48 | 50 | 8.4 | 70 | 70 | 12 | 12.5 |

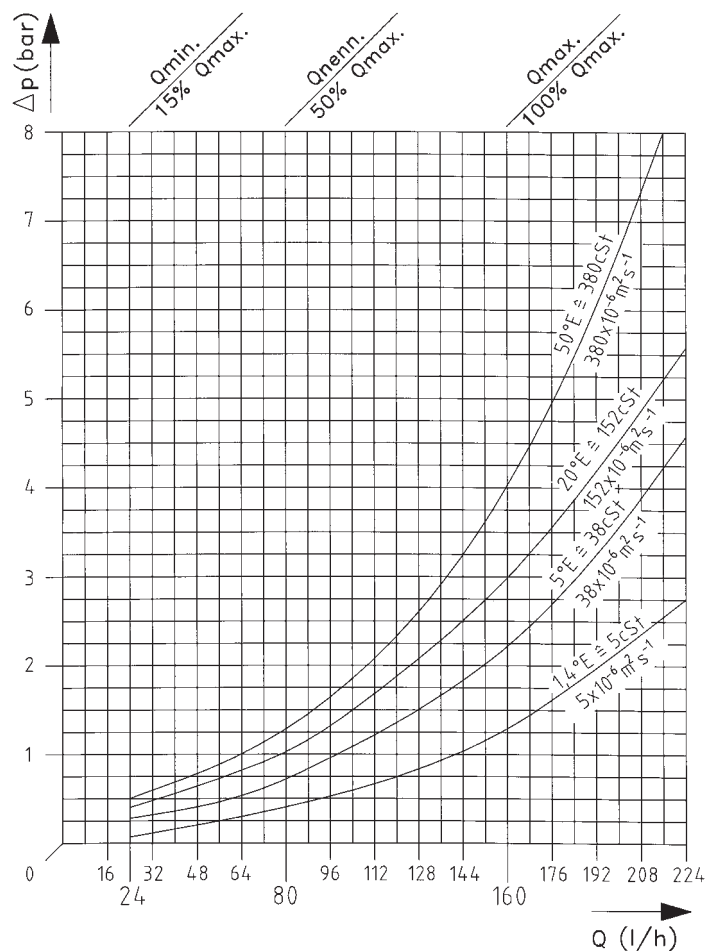
## Flow characteristics $\Delta p - Q$ for hp overflow valves

2.7

### Series B-PP-E



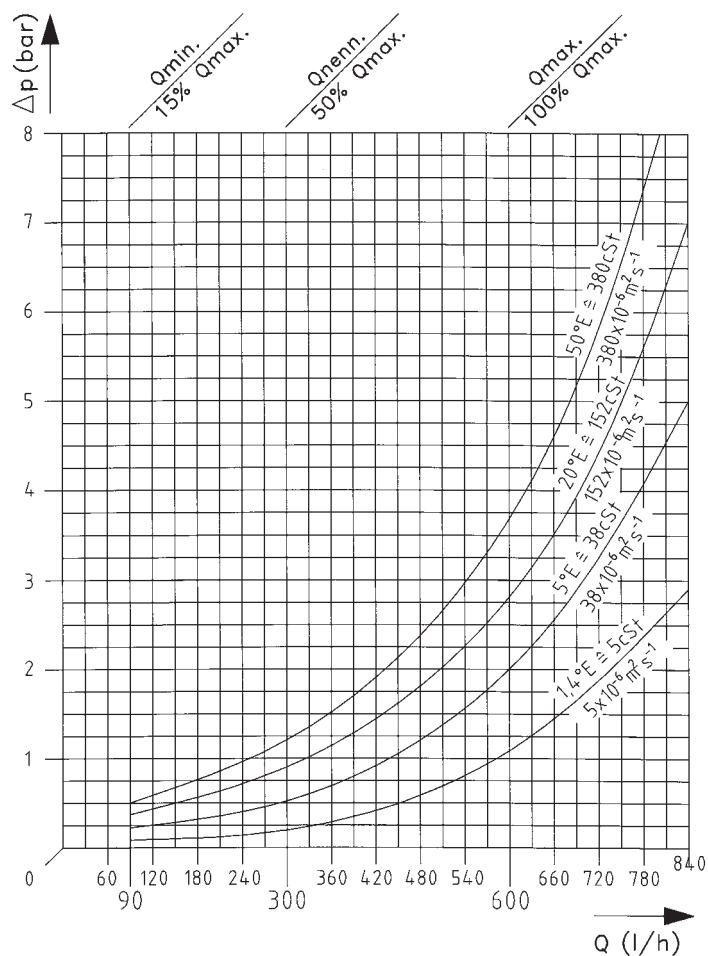
### Series B-P-E



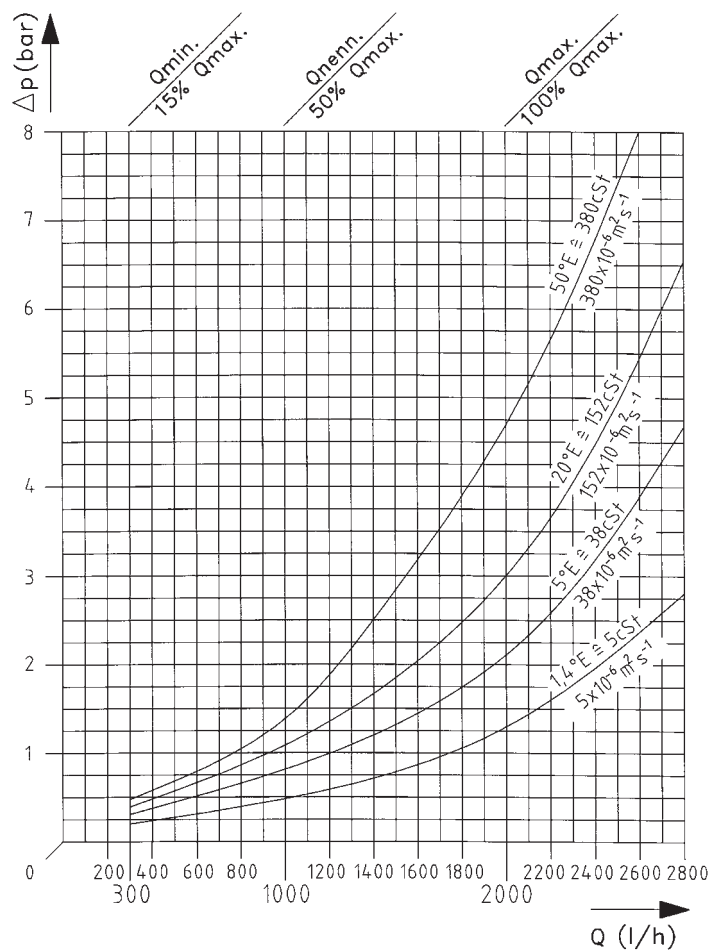
## Flow characteristics $\Delta p - Q$ for hp overflow valves

2.7

**Series B-G-E  
and FDR 15-E**



**Series B-GH-E  
and FDR 20-E**

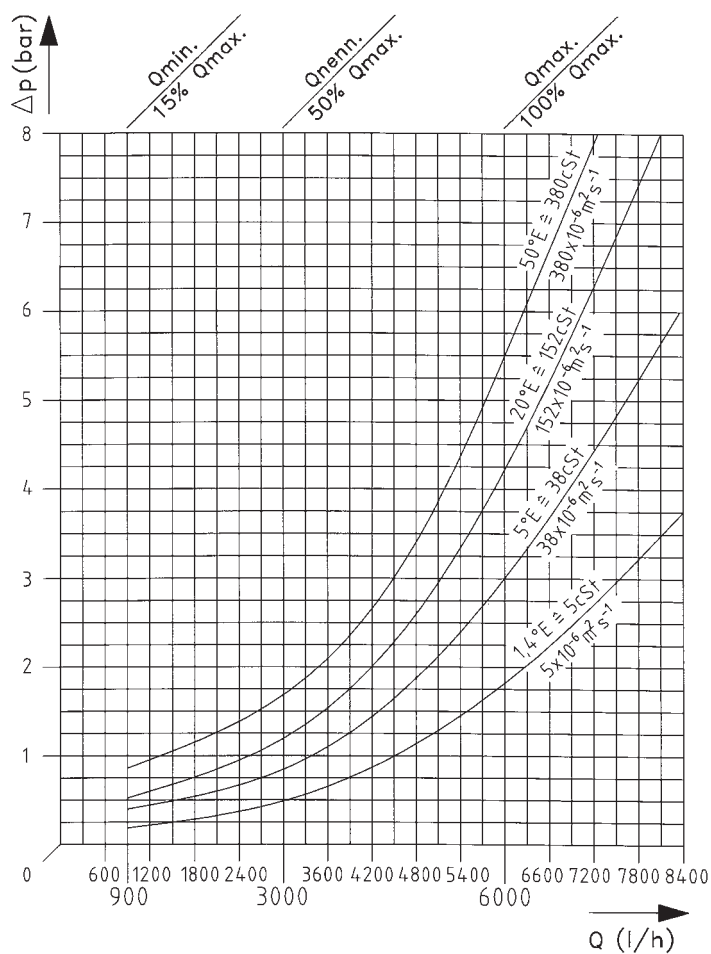




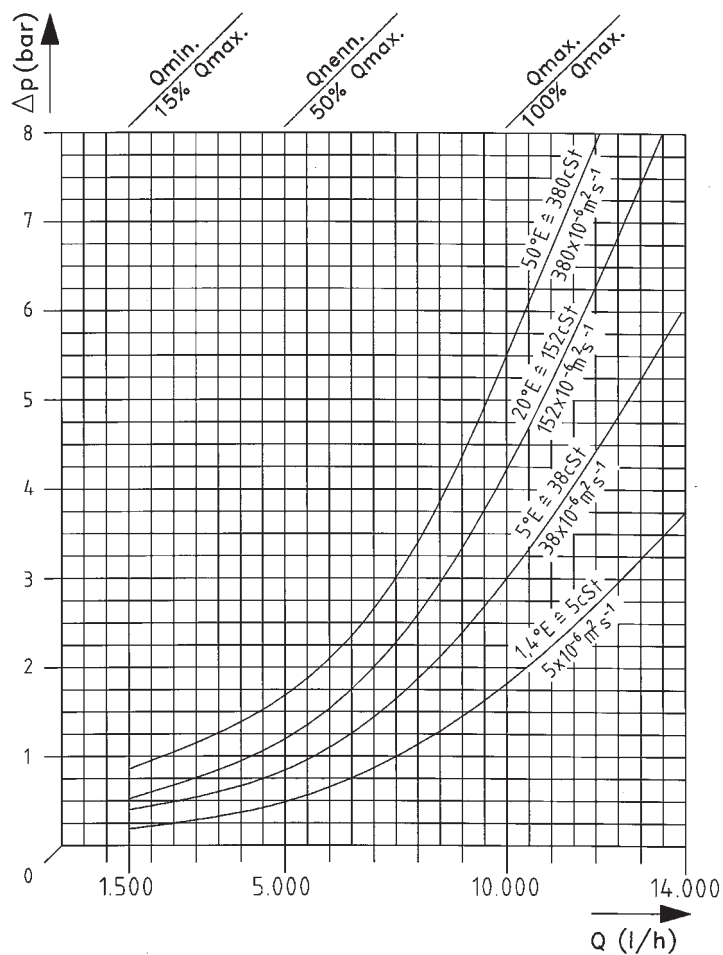
## Flow characteristics $\Delta p - Q$ for hp overflow valves

2.7

**Series B-GHG-E  
and FDR 25-E**



**Series B-GHG 1 1/4"-E  
and FDR 32-E**



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## hp-Motor pumps; series SMG

3.0

Horizontal single system with hp industrial pumps with axial face seal able to handle pressures up to 5 bar and max. 150 °C.  
Easy to operate. Very safe. Exceptionally quiet. High suction capacity and operating life.

**When used as supply aggregate for fuel oil feed as per DIN 4736, the max operating pressure may not exceed 6 bar<sup>2)</sup>.**

*When used:* as discharge or supply unit; designed for pressures of up to 9 bar.  
as pressure or spray unit; designed for pressures of up to 30 bar.  
for higher pressures; designed for pressures of up to 40 bar.

- The pump groups are equipped with three-phase standard motors B3/B14 or B3/B5, 400 V, 50 Hz, 1400 min<sup>-1</sup>, protection standard IP 54, Isolation class F.  
**From 4 kW, the motors are threaded for 400/690 V, 50 Hz.**  
**Y-Δ-circuit with power supply must be indicated when ordering.**
- Other voltages and frequencies are available at a surcharge upon request.
- Mounting position: horizontal, with the connections facing upwards.



These motor pump groups can be equipped with all pumps of the approved hp-Industrial pump programme.

### Key for determination of the order numbers:

e.g.: **SMG . . .** — — — — —

| Series size                                                              | Direction of rotation <sup>1)</sup><br>viewed from pump shaft                                   | Pressure<br>stage bar                                                                                                   | Special production and accessories<br>(add code letters consecutively)                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| e. g. SMG 1507<br>See selection chart<br>on the following<br>sites . . . | <b>I</b> = counterclockwise,<br><b>standard model</b><br><br><b>D</b> = clockwise<br>on request | <b>0</b> = 0,5 - 1,5<br><br><b>1</b> = 1 - 4<br><br><b>2</b> = 2 - 9<br><br><b>3</b> = 6 - 25<br><br><b>4</b> = 15 - 40 | <b>H1</b> = Electric heating with heating cartridge, see tables for heating capacity. (See pump accessories page 16.)<br><br><b>Wa</b> = With oil pan and anti-vibration pads for mounting on the wall. (See accessories page 38.)<br><br><b>LH</b> = Oil pan equipped with leak detection<br><br><b>S<sup>2)</sup></b> = With electric pressure switch for pressure line monitoring. (Pipe-burst check.)<br><br><b>DT</b> = Pressure transmitter |

**Max. permissible vacuum pressure at pump connection A -0.6 bar.**  
**Warning, gas discharge starts at -0.4 bar**

**Ordering example:** hp motor pump group series size SMG 1568 with hp industrial pump type VBHP-I with integrated overflow valve; direction of rotation viewed from pump shaft: I = counterclockwise; flow rate: 700 l/h at 1400 min<sup>-1</sup> and 25 bar; operating pressure: 25 bar; pressure range: 15 to 25 bar; max. pressure: 25 bar; medium: fuel oil S; viscosity: 6 cSt. at 140 °C; motor output: 1,5 kW, voltage 230/400V, 50Hz, isolation class B; protection standard: IP 54; accessories: axial face seal Viton V, electric heating H1.

**Order-Nr.: SMG 1568 - I - 3 - H1**

For assembly, start-up and maintenance, please adhere to the instruction manual that comes with each device!

## hp-Motor pump groups; SMG series

3.1

### Series B; without overflow valve

Single systems with 1400 min<sup>-1</sup> and hp industrial pumps.

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 80 cSt. From 80 to 150 cSt, the motor must be one power stage stronger. Available at a surcharge upon request.

**The pump connections are indicated as follows:**

**A** = suction connection      **S** = delivery connection

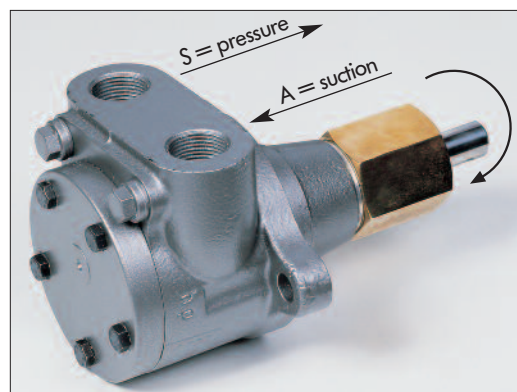


The standard models of the pumps are designed with a counterclockwise direction of rotation (viewed from the pump shaft).

The position of the pump connections is independent of the direction of rotation. (See illustration.)

**Direction of rotation I = counterclockwise, standard model**

For clockwise rotation, D, the oil connections A = suction and S = delivery are interchanged.



| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | Connections<br>1) * | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|---------------------|-------------------|---------------------|-------------|-------------------------|
|             |           | at 0 - 9 bar                        | at 30 bar |              |                     |                   |                     |             |                         |
| SMG 1501    | BP        | 45 l/h                              | –         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350001     | p <sub>max</sub> 9 bar  |
| SMG 1502    | BM        | 80 l/h                              | –         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350002     |                         |
| SMG 1503    | BG        | 120 l/h                             | –         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350003     |                         |
| SMG 1504    | BF        | 160 l/h                             | –         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350004     |                         |
| SMG 1505    | BGP       | 300 l/h                             | –         | 0,18 kW      | G 1/2"              | 100               | 38/12               | 0350005     |                         |
| SMG 1506    | BGM       | 450 l/h                             | –         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0350006     |                         |
| SMG 1507    | BGG       | 600 l/h                             | –         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0350007     |                         |
| SMG 1508    | BHP       | 1000 l/h                            | –         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0350008     |                         |
| SMG 1509    | BHM       | 1500 l/h                            | –         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0350009     |                         |
| SMG 1510    | BHG       | 2000 l/h                            | –         | 1,1 kW       | G 3/4"              | 160               | 56/18               | 0350010     |                         |
| SMG 1511    | BHGP      | 3000 l/h                            | –         | 1,5 kW       | G 1 1/2"            | 280               | 75/22               | 0350011     |                         |
| SMG 1512    | BHGM      | 4500 l/h                            | –         | 2,2 kW       | G 1 1/2"            | 280               | 75/22               | 0350012     |                         |
| SMG 1513    | BHGG      | 6000 l/h                            | –         | 3,0 kW       | G 1 1/2"            | 280               | 75/22               | 0350013     |                         |
|             |           |                                     |           |              |                     |                   |                     |             |                         |
| SMG 1521    | BP        | 45 l/h                              | 30 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350014     | p <sub>max</sub> 30 bar |
| SMG 1522    | BM        | 80 l/h                              | 60 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350015     |                         |
| SMG 1523    | BG        | 120 l/h                             | 100 l/h   | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0350016     |                         |
| SMG 1524    | BF        | 160 l/h                             | 140 l/h   | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0350017     |                         |
| SMG 1525    | BGP       | 300 l/h                             | 240 l/h   | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0350018     |                         |
| SMG 1526    | BGM       | 450 l/h                             | 390 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0350019     |                         |
| SMG 1527    | BGG       | 600 l/h                             | 540 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0350020     |                         |
| SMG 1528    | BHP       | 1000 l/h                            | 700 l/h   | 1,5 kW       | G 3/4"              | 160               | 56/18               | 0350021     |                         |
| SMG 1529    | BHM       | 1500 l/h                            | 1200 l/h  | 2,2 kW       | G 3/4"              | 160               | 56/18               | 0350022     |                         |
| SMG 1530    | BHG       | 2000 l/h                            | 1700 l/h  | 3,0 kW       | G 3/4"              | 160               | 56/18               | 0350023     |                         |
| SMG 1531    | BHGP      | 3000 l/h                            | 2200 l/h  | 4,0 kW       | G 1 1/2"            | 280               | 75/22               | 0350024     |                         |
| SMG 1532    | BHGM      | 4500 l/h                            | 3600 l/h  | 5,5 kW       | G 1 1/2"            | 280               | 75/22               | 0350025     |                         |
| SMG 1533    | BHGG      | 6000 l/h                            | 4800 l/h  | 7,5 kW       | G 1 1/2"            | 280               | 75/22               | 0350026     |                         |

| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | Connections<br>1) * | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|---------------------|-------------------|---------------------|-------------|-------------------------|
|             |           | at 0 bar                            | at 40 bar |              |                     |                   |                     |             |                         |
| SMG 1902    | BM        | 80 l/h                              | 50 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0390001     | p <sub>max</sub> 40 bar |
| SMG 1903    | BG        | 120 l/h                             | 80 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0390002     |                         |
| SMG 1904    | BF        | 160 l/h                             | 120 l/h   | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0390003     |                         |
| SMG 1905    | BGP       | 300 l/h                             | 200 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0390004     |                         |
| SMG 1906    | BGM       | 450 l/h                             | 360 l/h   | 1,1 kW       | G 1/2"              | 100               | 38/12               | 0390005     |                         |
| SMG 1907    | BGG       | 600 l/h                             | 480 l/h   | 1,5 kW       | G 1/2"              | 100               | 38/12               | 0390006     |                         |
| SMG 1908    | BHP       | 1000 l/h                            | 600 l/h   | 2,2 kW       | G 3/4"              | 160               | 56/18               | 0390007     |                         |
| SMG 1909    | BHM       | 1500 l/h                            | 1000 l/h  | 3,0 kW       | G 3/4"              | 160               | 56/18               | 0390008     |                         |
| SMG 1910    | BHG       | 2000 l/h                            | 1400 l/h  | 4,0 kW       | G 3/4"              | 160               | 56/18               | 0390009     |                         |
| SMG 1911    | BHGP      | 3000 l/h                            | 2000 l/h  | 5,5 kW       | G 1 1/2"            | 280               | 75/22               | 0390010     |                         |
| SMG 1912    | BHGM      | 4500 l/h                            | 3200 l/h  | 7,5 kW       | G 1 1/2"            | 280               | 75/22               | 0390011     |                         |

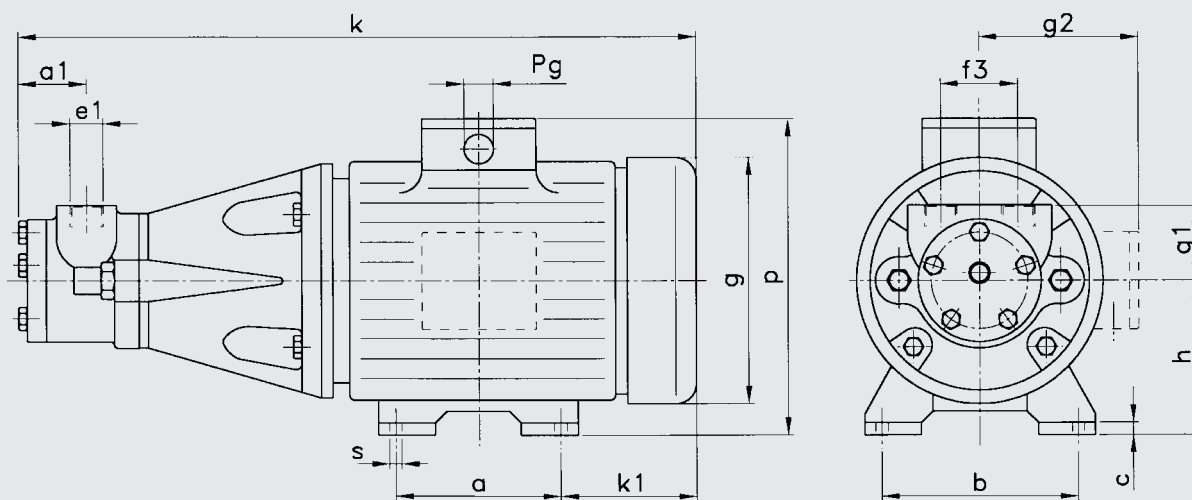
1) Cyl. Withworth Pipe Threading: G...A DIN ISO 228

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.



## Series B; without overflow valve

3.1



| Series size | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |          |     |     |    |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|----------|-----|-----|----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1       | f3  | g   | g1 | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1501    | BP        | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1502    | BM        | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1503    | BG        | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1504    | BF        | 160 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1505    | BGP       | 300 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 1/2"   | 44  | 124 | 43 | -   | 63  | 362 | 63  | 163 | 7   | 11   |
| SMG 1506    | BGM       | 450 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2"   | 44  | 139 | 43 | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1507    | BGG       | 600 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2"   | 44  | 139 | 43 | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1508    | BHP       | 1000 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4"   | 67  | 157 | 65 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1509    | BHM       | 1500 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4"   | 67  | 157 | 65 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1510    | BHG       | 2000 l/h   | 1,1 kW       | 100        | 49 | 140 | 13 | G 3/4"   | 67  | 181 | 65 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1511    | BHGP      | 3000 l/h   | 1,5 kW       | 125        | 65 | 140 | 13 | G 1 1/2" | 100 | 181 | 90 | 137 | 90  | 617 | 95  | 214 | 11  | 13,5 |
| SMG 1512    | BHGM      | 4500 l/h   | 2,2 kW       | 140        | 65 | 160 | 14 | G 1 1/2" | 100 | 202 | 90 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1513    | BHGG      | 6000 l/h   | 3,0 kW       | 140        | 65 | 160 | 14 | G 1 1/2" | 100 | 202 | 90 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
|             |           |            |              |            |    |     |    |          |     |     |    |     |     |     |     |     |     |      |
| SMG 1521    | BP        | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1522    | BM        | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1523    | BG        | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1524    | BF        | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1525    | BGP       | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2"   | 44  | 139 | 43 | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1526    | BGM       | 450 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2"   | 44  | 157 | 43 | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1527    | BGG       | 600 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2"   | 44  | 157 | 43 | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1528    | BHP       | 1000 l/h   | 1,5 kW       | 125        | 49 | 140 | 13 | G 3/4"   | 67  | 181 | 65 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1529    | BHM       | 1500 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4"   | 67  | 202 | 65 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1530    | BHG       | 2000 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4"   | 67  | 202 | 65 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1531    | BHGP      | 3000 l/h   | 4,0 kW       | 140        | 65 | 190 | 15 | G 1 1/2" | 100 | 227 | 90 | 150 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1532    | BHGM      | 4500 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1533    | BHGG      | 6000 l/h   | 7,5 kW       | 140        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
|             |           |            |              |            |    |     |    |          |     |     |    |     |     |     |     |     |     |      |
| SMG 1902    | BM        | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8"   | 38  | 124 | 43 | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1903    | BG        | 120 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1904    | BF        | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1905    | BGP       | 300 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2"   | 44  | 157 | 43 | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1906    | BGM       | 450 l/h    | 1,1 kW       | 100        | 43 | 140 | 13 | G 1/2"   | 44  | 181 | 43 | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1907    | BGG       | 600 l/h    | 1,5 kW       | 125        | 43 | 140 | 13 | G 1/2"   | 44  | 181 | 43 | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1908    | BHP       | 1000 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4"   | 67  | 202 | 65 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1909    | BHM       | 1500 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4"   | 67  | 202 | 65 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1910    | BHG       | 2000 l/h   | 4,0 kW       | 140        | 49 | 190 | 15 | G 3/4"   | 67  | 227 | 65 | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1911    | BHGP      | 3000 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1912    | BHGM      | 4500 l/h   | 7,5 kW       | 178        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |

## hp-Motor pump group; SMG series

3.2

### Series VB with integrated overflow valve

Single systems with 1400 min<sup>-1</sup> and hp industrial pumps.

#### Standard model:

A system up to 9 bar: **Pressure stage 2 = 2 to 9 bar. Limited to a max. pressure of 6 bar as per DIN 4736.** System up to 30 or 40 bar: **Pressure stage 4 = 15 to 40 bar.**

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 80 cSt. From 80 to 150 cSt, the motor must be one power stage size stronger.

Available at a surcharge upon request.



#### The pump connections are indicated as follows:

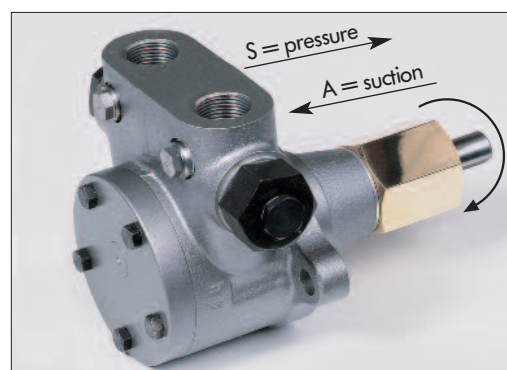
A = suction connection      S = delivery connection

The standard models of the pumps are designed with a counterclockwise direction of rotation (viewed from the pump shaft).

The position of the pump connections is independent of the direction of rotation. (See illustration.)

#### Direction of rotation I = counterclockwise, standard model

For clockwise rotation, D, the oil connections A = suction and S = delivery are interchanged



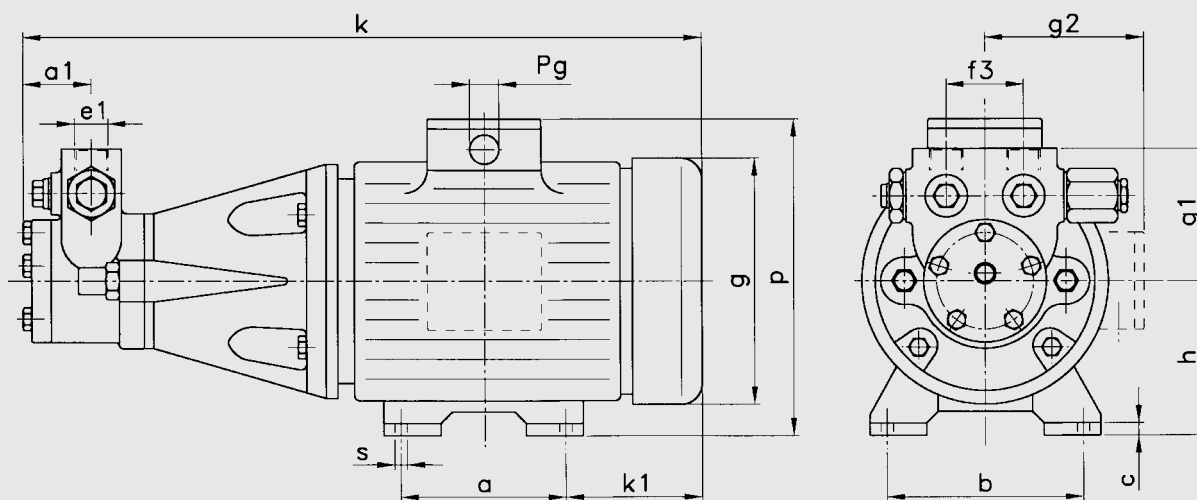
| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | Connections* | H1 Heater Watt | Gear rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|--------------|----------------|------------------|-------------|-------------------------|
|             |           | at 0 - 9 bar                        | at 30 bar |              |              |                |                  |             |                         |
| SMG 1541    | VBP       | 45 l/h                              | -         | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350027     | p <sub>max</sub> 9 bar  |
| SMG 1542    | VBM       | 80 l/h                              | -         | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350028     |                         |
| SMG 1543    | VBG       | 120 l/h                             | -         | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350029     |                         |
| SMG 1544    | VBF       | 160 l/h                             | -         | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350030     |                         |
| SMG 1545    | VBGP      | 300 l/h                             | -         | 0,18 kW      | G 1/2"       | 100            | 38/12            | 0350031     |                         |
| SMG 1546    | VBGM      | 450 l/h                             | -         | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0350032     |                         |
| SMG 1547    | VBGG      | 600 l/h                             | -         | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0350033     |                         |
| SMG 1548    | VBHP      | 1000 l/h                            | -         | 0,75 kW      | G 3/4"       | 160            | 56/18            | 0350034     |                         |
| SMG 1549    | VBHM      | 1500 l/h                            | -         | 0,75 kW      | G 3/4"       | 160            | 56/18            | 0350035     |                         |
| SMG 1550    | VBHG      | 2000 l/h                            | -         | 1,1 kW       | G 3/4"       | 160            | 56/18            | 0350036     |                         |
| SMG 1551    | VBHGP     | 3000 l/h                            | -         | 1,5 kW       | G 1"         | 280            | 75/22            | 0350037     |                         |
| SMG 1552    | VBHGM     | 4500 l/h                            | -         | 2,2 kW       | G 1"         | 280            | 75/22            | 0350038     |                         |
| SMG 1553    | VBHGG     | 6000 l/h                            | -         | 3,0 kW       | G 1"         | 280            | 75/22            | 0350039     |                         |
| SMG 1561    | VBP       | 45 l/h                              | 30 l/h    | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350040     | p <sub>max</sub> 30 bar |
| SMG 1562    | VBM       | 80 l/h                              | 60 l/h    | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350041     |                         |
| SMG 1563    | VBG       | 120 l/h                             | 100 l/h   | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0350042     |                         |
| SMG 1564    | VBF       | 160 l/h                             | 140 l/h   | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0350043     |                         |
| SMG 1565    | VBGP      | 300 l/h                             | 240 l/h   | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0350044     |                         |
| SMG 1566    | VBGM      | 450 l/h                             | 390 l/h   | 0,75 kW      | G 1/2"       | 100            | 38/12            | 0350045     |                         |
| SMG 1567    | VBGG      | 600 l/h                             | 540 l/h   | 0,75 kW      | G 1/2"       | 100            | 38/12            | 0350046     |                         |
| SMG 1568    | VBHP      | 1000 l/h                            | 700 l/h   | 1,5 kW       | G 3/4"       | 160            | 56/18            | 0350047     |                         |
| SMG 1569    | VBHM      | 1500 l/h                            | 1200 l/h  | 2,2 kW       | G 3/4"       | 160            | 56/18            | 0350048     |                         |
| SMG 1570    | VBHG      | 2000 l/h                            | 1700 l/h  | 3,0 kW       | G 3/4"       | 160            | 56/18            | 0350049     |                         |
| SMG 1571    | VBHGP     | 3000 l/h                            | 2200 l/h  | 4,0 kW       | G 1"         | 280            | 75/22            | 0350050     |                         |
| SMG 1572    | VBHGM     | 4500 l/h                            | 3600 l/h  | 5,5 kW       | G 1"         | 280            | 75/22            | 0350051     |                         |
| SMG 1573    | VBHGG     | 6000 l/h                            | 4800 l/h  | 7,5 kW       | G 1"         | 280            | 75/22            | 0350052     |                         |

| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | connections* | H1 Heater Watt | Gear rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|--------------|----------------|------------------|-------------|-------------------------|
|             |           | at 0 bar                            | at 40 bar |              |              |                |                  |             |                         |
| SMG 1922    | VBM       | 80 l/h                              | 50 l/h    | 0,18 kW      | G 3/8"       | 100            | 25/12            | 0390023     | p <sub>max</sub> 40 bar |
| SMG 1923    | VBG       | 120 l/h                             | 80 l/h    | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0390024     |                         |
| SMG 1924    | VBF       | 160 l/h                             | 120 l/h   | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0390025     |                         |
| SMG 1925    | VBGP      | 300 l/h                             | 200 l/h   | 0,75 kW      | G 1/2"       | 100            | 38/12            | 0390026     |                         |
| SMG 1926    | VBGM      | 450 l/h                             | 360 l/h   | 1,1 kW       | G 1/2"       | 100            | 38/12            | 0390027     |                         |
| SMG 1927    | VBGG      | 600 l/h                             | 480 l/h   | 1,5 kW       | G 1/2"       | 100            | 38/12            | 0390028     |                         |
| SMG 1928    | VBHP      | 1000 l/h                            | 600 l/h   | 2,2 kW       | G 3/4"       | 160            | 56/18            | 0390029     |                         |
| SMG 1929    | VBHM      | 1500 l/h                            | 1000 l/h  | 3,0 kW       | G 3/4"       | 160            | 56/18            | 0390030     |                         |
| SMG 1930    | VBHG      | 2000 l/h                            | 1400 l/h  | 4,0 kW       | G 3/4"       | 160            | 56/18            | 0390031     |                         |
| SMG 1931    | VBHGP     | 3000 l/h                            | 2000 l/h  | 5,5 kW       | G 1"         | 280            | 75/22            | 0390032     |                         |
| SMG 1932    | VBHGM     | 4500 l/h                            | 3200 l/h  | 7,5 kW       | G 1"         | 280            | 75/22            | 0390033     |                         |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Series VB; With integrated overflow valve

3.2



| Series size | Pump type | Dis-charge | Motor-output | Dimensions |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|--------|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1     | f3 | g   | g1  | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1541    | VBP       | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1542    | VBM       | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1543    | VBG       | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1544    | VBF       | 160 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1545    | VBGP      | 300 l/h    | 0,18 kW      | 80         | 43 | 100 | 7  | G 1/2" | 44 | 124 | 75  | -   | 63  | 362 | 63  | 163 | 7   | 11   |
| SMG 1546    | VBGM      | 450 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1547    | VBGG      | 600 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1548    | VBHP      | 1000 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 90  | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1549    | VBHM      | 1500 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 90  | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1550    | VBHG      | 2000 l/h   | 1,1 kW       | 100        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1551    | VBHGP     | 3000 l/h   | 1,5 kW       | 125        | 65 | 140 | 13 | G 1"   | 80 | 181 | 120 | 137 | 90  | 617 | 95  | 214 | 11  | 13,5 |
| SMG 1552    | VBHGM     | 4500 l/h   | 2,2 kW       | 140        | 65 | 160 | 14 | G 1"   | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1553    | VBHGG     | 6000 l/h   | 3,0 kW       | 140        | 65 | 160 | 14 | G 1"   | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
|             |           |            |              |            |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
| SMG 1561    | VBP       | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1562    | VBM       | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1563    | VBG       | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1564    | VBF       | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1565    | VBGP      | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1566    | VBGM      | 450 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1567    | VBGG      | 600 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1568    | VBHP      | 1000 l/h   | 1,5 kW       | 125        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1569    | VBHM      | 1500 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 80  | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1570    | VBHG      | 2000 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 90  | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1571    | VBHGP     | 3000 l/h   | 4,0 kW       | 140        | 65 | 190 | 15 | G 1"   | 80 | 227 | 120 | 150 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1572    | VBHGM     | 4500 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1573    | VBHGG     | 6000 l/h   | 7,5 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
|             |           |            |              |            |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
| SMG 1922    | VBM       | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1923    | VBG       | 120 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1924    | VBF       | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1925    | VBGP      | 300 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1926    | VBGM      | 450 l/h    | 1,1 kW       | 100        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1927    | VBGG      | 600 l/h    | 1,5 kW       | 125        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1928    | VBHP      | 1000 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 90  | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1929    | VBHM      | 1500 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 90  | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1930    | VBHG      | 2000 l/h   | 4,0 kW       | 140        | 49 | 190 | 15 | G 3/4" | 67 | 227 | 90  | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1931    | VBHGP     | 3000 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1932    | VBHGM     | 4500 l/h   | 7,5 kW       | 178        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |



## hp-Motor pump group; SMG series

3.3

### Series VBR with integrated overflow valve and bypass

Single system with 1400 min<sup>-1</sup> and hp industrial pumps

#### Standard model:

System up to 9 bar: **Pressure stage 2 = 2 to 9 bar.**

**Limited to a max. pressure of 6 bar as per DIN 4736.**

System up to 30 or 40 bar: **Pressure stage 4 = 15 to 40 bar.**



#### The pump connections are indicated as follows:

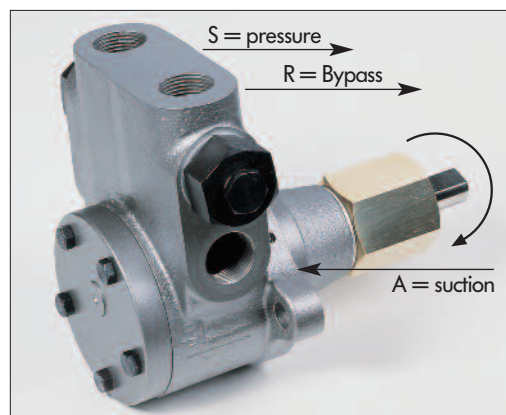
**A** = suction connection    **S** = delivery connection    **R** = bypass connection

The standard models of the pumps are designed with a counterclockwise direction of rotation (viewed from the pump shaft). The position of the pump connections is independent of the direction of rotation. (See illustration.)

#### Direction of rotation I = counterclockwise, standard model

For clockwise rotation, D, the oil connections S = delivery and R = bypass are interchanged.

The suction connection A = suction is found on the other side.



| Series<br>size | Pump<br>type | Discharge at 1400 min <sup>-1</sup> |           | Motor-<br>output | Connections*       | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|----------------|--------------|-------------------------------------|-----------|------------------|--------------------|-------------------|---------------------|-------------|-------------------------|
|                |              | at 0 - 9 bar                        | at 30 bar |                  |                    |                   |                     |             |                         |
| SMG 1601       | VBRP         | 45 l/h                              | –         | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360001     | p <sub>max</sub> 9 bar  |
| SMG 1602       | VBRM         | 80 l/h                              | –         | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360002     |                         |
| SMG 1603       | VBRG         | 120 l/h                             | –         | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360003     |                         |
| SMG 1604       | VBRF         | 160 l/h                             | –         | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360004     |                         |
| SMG 1605       | VBGRP        | 300 l/h                             | –         | 0,18 kW          | G 1/2"             | 100               | 38/12               | 0360005     |                         |
| SMG 1606       | VBGRM        | 450 l/h                             | –         | 0,37 kW          | G 1/2"             | 100               | 38/12               | 0360006     |                         |
| SMG 1607       | VBGRG        | 600 l/h                             | –         | 0,37 kW          | G 1/2"             | 100               | 38/12               | 0360007     |                         |
| SMG 1608       | VBHRP        | 1000 l/h                            | –         | 0,75 kW          | G 3/4"             | 160               | 56/18               | 0360008     |                         |
| SMG 1609       | VBHRM        | 1500 l/h                            | –         | 0,75 kW          | G 3/4"             | 160               | 56/18               | 0360009     |                         |
| SMG 1610       | VBHRG        | 2000 l/h                            | –         | 1,1 kW           | G 3/4"             | 160               | 56/18               | 0360010     |                         |
| SMG 1611       | VBHGRP       | 3000 l/h                            | –         | 1,5 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360011     |                         |
| SMG 1612       | VBHGRM       | 4500 l/h                            | –         | 2,2 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360012     |                         |
| SMG 1613       | VBHGRG       | 6000 l/h                            | –         | 3,0 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360013     |                         |
|                |              |                                     |           |                  |                    |                   |                     |             |                         |
| SMG 1621       | VBRP         | 45 l/h                              | 30 l/h    | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360014     | p <sub>max</sub> 30 bar |
| SMG 1622       | VBRM         | 80 l/h                              | 60 l/h    | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360015     |                         |
| SMG 1623       | VBRG         | 120 l/h                             | 100 l/h   | 0,18 kW          | G 3/8"             | 100               | 25/12               | 0360016     |                         |
| SMG 1624       | VBRF         | 160 l/h                             | 140 l/h   | 0,37 kW          | G 3/8"             | 100               | 25/12               | 0360017     |                         |
| SMG 1625       | VBGRP        | 300 l/h                             | 240 l/h   | 0,37 kW          | G 1/2"             | 100               | 38/12               | 0360018     |                         |
| SMG 1626       | VBGRM        | 450 l/h                             | 390 l/h   | 0,75 kW          | G 1/2"             | 100               | 38/12               | 0360019     |                         |
| SMG 1627       | VBGRG        | 600 l/h                             | 540 l/h   | 0,75 kW          | G 1/2"             | 100               | 38/12               | 0360020     |                         |
| SMG 1628       | VBHRP        | 1000 l/h                            | 700 l/h   | 1,5 kW           | G 3/4"             | 160               | 56/18               | 0360021     |                         |
| SMG 1629       | VBHRM        | 1500 l/h                            | 1200 l/h  | 2,2 kW           | G 3/4"             | 160               | 56/18               | 0360022     |                         |
| SMG 1630       | VBHRG        | 2000 l/h                            | 1700 l/h  | 3,0 kW           | G 3/4"             | 160               | 56/18               | 0360023     |                         |
| SMG 1631       | VBHGRP       | 3000 l/h                            | 2200 l/h  | 4,0 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360024     |                         |
| SMG 1632       | VBHGRM       | 4500 l/h                            | 3600 l/h  | 5,5 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360025     |                         |
| SMG 1633       | VBHGRG       | 6000 l/h                            | 4800 l/h  | 7,5 kW           | G 1" <sup>1)</sup> | 280               | 75/22               | 0360026     |                         |

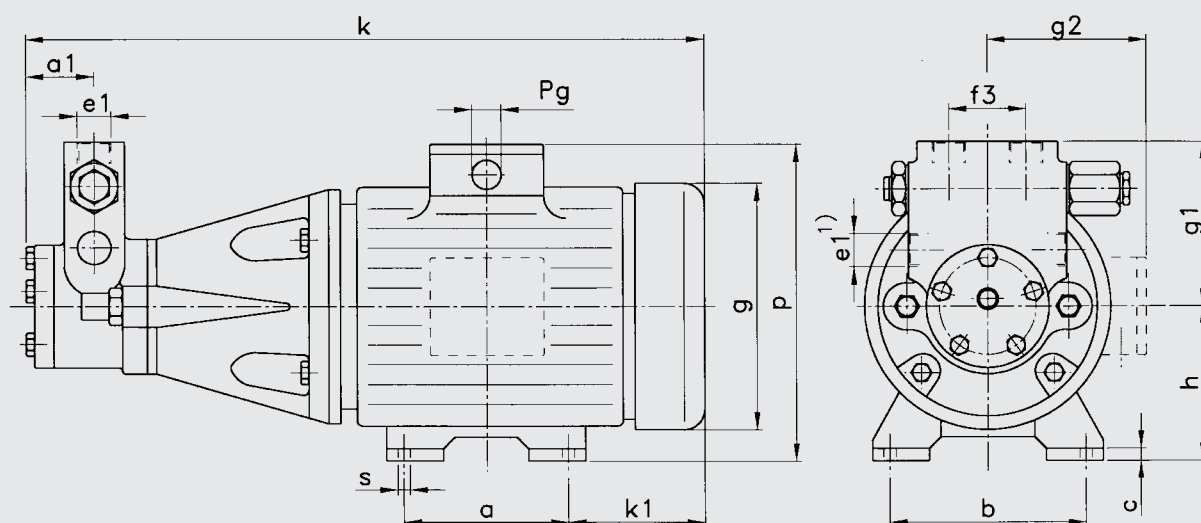
| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor-output | Connections<br>1) * | H1 Heater Watt | Gear rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|---------------------|----------------|------------------|-------------|-------------------------|
|             |           | at 0 bar                            | at 40 bar |              |                     |                |                  |             |                         |
| SMG 1942    | VBRM      | 80 l/h                              | 50 l/h    | 0,18 kW      | G 3/8"              | 100            | 25/12            | 0390045     | p <sub>max</sub> 40 bar |
| SMG 1943    | VBRG      | 120 l/h                             | 80 l/h    | 0,37 kW      | G 3/8"              | 100            | 25/12            | 0390046     |                         |
| SMG 1944    | VBRF      | 160 l/h                             | 120 l/h   | 0,37 kW      | G 3/8"              | 100            | 25/12            | 0390047     |                         |
| SMG 1945    | VBGRP     | 300 l/h                             | 200 l/h   | 0,75 kW      | G 1/2"              | 100            | 38/12            | 0390048     |                         |
| SMG 1946    | VBGRM     | 450 l/h                             | 360 l/h   | 1,1 kW       | G 1/2"              | 100            | 38/12            | 0390049     |                         |
| SMG 1947    | VBGRG     | 600 l/h                             | 480 l/h   | 1,5 kW       | G 1/2"              | 100            | 38/12            | 0390050     |                         |
| SMG 1948    | VBHRP     | 1000 l/h                            | 600 l/h   | 2,2 kW       | G 3/4"              | 160            | 56/18            | 0390051     |                         |
| SMG 1949    | VBHRM     | 1500 l/h                            | 1000 l/h  | 3,0 kW       | G 3/4"              | 160            | 56/18            | 0390052     |                         |
| SMG 1950    | VBHRG     | 2000 l/h                            | 1400 l/h  | 4,0 kW       | G 3/4"              | 160            | 56/18            | 0390053     |                         |
| SMG 1951    | VBHGRP    | 3000 l/h                            | 2000 l/h  | 5,5 kW       | G 1" <sup>1)</sup>  | 280            | 75/22            | 0390054     |                         |
| SMG 1952    | VBHGRM    | 4500 l/h                            | 3200 l/h  | 7,5 kW       | G 1" <sup>1)</sup>  | 280            | 75/22            | 0390055     |                         |

1) The suction connection on the side is A = G 1 1/2" on SMG 1611 - SMG 1631, SMG 1631 - 1630, SMG 1951 - 1952.

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Series VBR; with integrated overflow valves and bypass

### 3.3



| Series size | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|--------|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1     | f3 | g   | g1  | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1601    | VBRP      | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1602    | VBRM      | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1603    | VBRG      | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1604    | VBRF      | 160 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1605    | VBGRP     | 300 l/h    | 0,18 kW      | 80         | 43 | 100 | 7  | G 1/2" | 44 | 124 | 94  | -   | 63  | 362 | 63  | 163 | 7   | 11   |
| SMG 1606    | VBGRM     | 450 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 94  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1607    | VBGRG     | 600 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 94  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1608    | VBHRP     | 1000 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 115 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1609    | VBHRM     | 1500 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 115 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1610    | VBHRG     | 2000 l/h   | 1,1 kW       | 100        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 115 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1611    | VBHGRP    | 3000 l/h   | 1,5 kW       | 125        | 65 | 140 | 13 | G 1"1) | 80 | 181 | 120 | 137 | 90  | 617 | 95  | 214 | 11  | 13,5 |
| SMG 1612    | VBHGRM    | 4500 l/h   | 2,2 kW       | 140        | 65 | 160 | 14 | G 1"1) | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1613    | VBHGRG    | 6000 l/h   | 3,0 kW       | 140        | 65 | 160 | 14 | G 1"1) | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1621    | VBRP      | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1622    | VBRM      | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1623    | VBRG      | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1624    | VBRF      | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 90  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1625    | VBGRP     | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 94  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1626    | VBGRM     | 450 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 94  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1627    | VBGRG     | 600 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 94  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1628    | VBHRP     | 1000 l/h   | 1,5 kW       | 125        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 115 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1629    | VBHRM     | 1500 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 115 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1630    | VBHRG     | 2000 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 115 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1631    | VBHGRP    | 3000 l/h   | 4,0 kW       | 140        | 65 | 190 | 15 | G 1"1) | 80 | 227 | 120 | 150 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1632    | VBHGRM    | 4500 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1"1) | 80 | 267 | 120 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1633    | VBHGRG    | 6000 l/h   | 7,5 kW       | 140        | 65 | 216 | 17 | G 1"1) | 80 | 267 | 120 | 183 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1942    | VBRM      | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 38 | 124 | 90  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1943    | VBRG      | 120 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 90  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1944    | VBRF      | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 90  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1945    | VBGRP     | 300 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 94  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1946    | VBGRM     | 450 l/h    | 1,1 kW       | 100        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 94  | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1947    | VBGRG     | 600 l/h    | 1,5 kW       | 125        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 94  | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1948    | VBHRP     | 1000 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 115 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1949    | VBHRM     | 1500 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 115 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1950    | VBHRG     | 2000 l/h   | 4,0 kW       | 140        | 49 | 190 | 15 | G 3/4" | 67 | 227 | 115 | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1951    | VBHGRP    | 3000 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1"1) | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
| SMG 1952    | VBHGRM    | 4500 l/h   | 7,5 kW       | 178        | 65 | 216 | 17 | G 1"1) | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |

1) For SMG 1611 - 1613, SMG 1631 - 1633, SMG 1951 - 1952 the suction connection is A = G 1 1/2"

## hp-Motor pump group; SMG series

3.4

### Series NV with integrated overflow valve and bypass

Single systems 1400 min<sup>-1</sup> and hp industrial pumps.

#### Standard model:

System up to 9 bar: **Pressure stage 2 = 2 to 9 bar.**

**Limited as per DIN 4736 to 6 bar.**

System up to 30 or 40 bar: **Pressure stage 4 = 15 to 40 bar.**

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 80 cSt. From 80 to 150 cSt, the motor must be one power stage size stronger. Available at a surcharge upon request.

#### The pump connections are indicated as follows:

**A** = suction connection **S** = delivery connection **R** = bypass connection

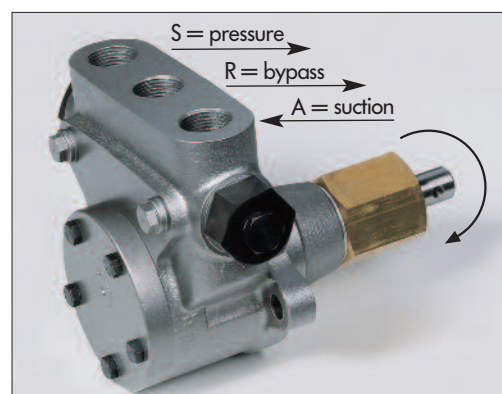
The standard model of the pumps is designed with a counterclockwise direction of rotation (viewed from the pump shaft).

The position of the pump connections is independent of the direction of rotation. (See illustration.)

#### Direction of rotation I = counterclockwise, standard model

For clockwise rotation, D, the connections A = suction and S = delivery are interchanged.

The middle connection remains unchanged.



| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | Connections<br>1) * | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|---------------------|-------------------|---------------------|-------------|-------------------------|
|             |           | at 0 - 9 bar                        | at 30 bar |              |                     |                   |                     |             |                         |
| SMG 1701    | NVBRP     | 45 l/h                              | -         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370001     | p <sub>max</sub> 9 bar  |
| SMG 1702    | NVBRM     | 80 l/h                              | -         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370002     |                         |
| SMG 1703    | NVBRG     | 120 l/h                             | -         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370003     |                         |
| SMG 1704    | NVBRF     | 160 l/h                             | -         | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370004     |                         |
| SMG 1705    | NVBGRP    | 300 l/h                             | -         | 0,18 kW      | G 1/2"              | 100               | 38/12               | 0370005     |                         |
| SMG 1706    | NVBGRM    | 450 l/h                             | -         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0370006     |                         |
| SMG 1707    | NVBGRG    | 600 l/h                             | -         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0370007     |                         |
| SMG 1708    | NVBHRP    | 1000 l/h                            | -         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0370008     | p <sub>max</sub> 30 bar |
| SMG 1709    | NVBHRM    | 1500 l/h                            | -         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0370009     |                         |
| SMG 1710    | NVBHRG    | 2000 l/h                            | -         | 1,1 kW       | G 3/4"              | 160               | 56/18               | 0370010     |                         |
| SMG 1721    | NVBRP     | 45 l/h                              | 30 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370011     |                         |
| SMG 1722    | NVBRM     | 80 l/h                              | 60 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370012     |                         |
| SMG 1723    | NVBRG     | 120 l/h                             | 100 l/h   | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0370013     |                         |
| SMG 1724    | NVBRF     | 160 l/h                             | 140 l/h   | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0370014     |                         |
| SMG 1725    | NVBGRP    | 300 l/h                             | 240 l/h   | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0370015     | p <sub>max</sub> 40 bar |
| SMG 1726    | NVBGRM    | 450 l/h                             | 390 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0370016     |                         |
| SMG 1727    | NVBGRG    | 600 l/h                             | 540 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0370017     |                         |
| SMG 1728    | NVBHRP    | 1000 l/h                            | 700 l/h   | 1,5 kW       | G 3/4"              | 160               | 56/18               | 0370018     |                         |
| SMG 1729    | NVBHRM    | 1500 l/h                            | 1200 l/h  | 2,2 kW       | G 3/4"              | 160               | 56/18               | 0370019     |                         |
| SMG 1730    | NVBHRG    | 2000 l/h                            | 1700 l/h  | 3,0 kW       | G 3/4"              | 160               | 56/18               | 0370020     |                         |

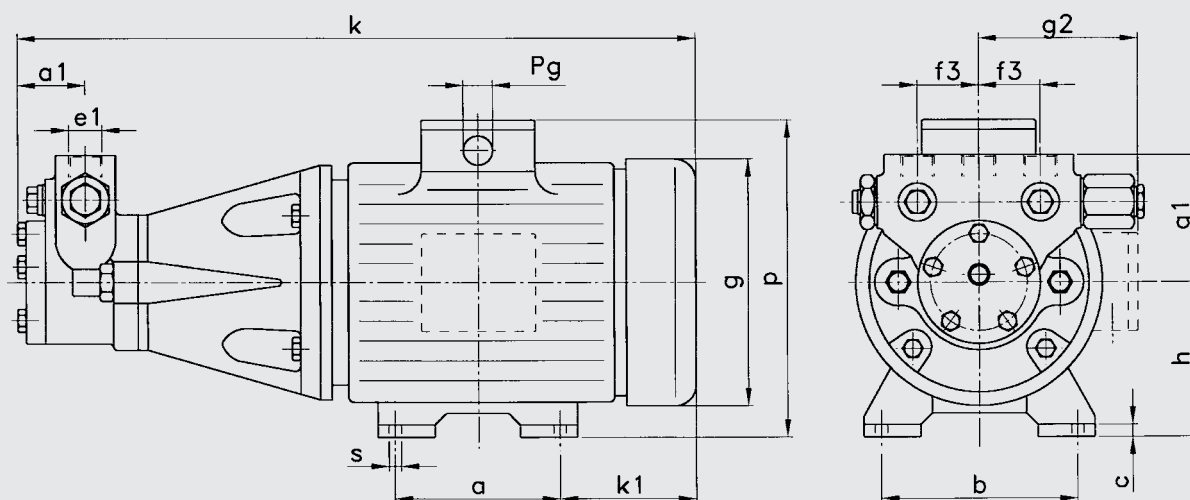
| Series size | Pump type | Discharge at 1400 min <sup>-1</sup> |           | Motor output | Connections<br>1) * | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|-------------|-----------|-------------------------------------|-----------|--------------|---------------------|-------------------|---------------------|-------------|-------------------------|
|             |           | at 0 bar                            | at 40 bar |              |                     |                   |                     |             |                         |
| SMG 1962    | NVBRM     | 80 l/h                              | 50 l/h    | 0,18 kW      | G 3/8"              | 100               | 25/12               | 0390067     | p <sub>max</sub> 40 bar |
| SMG 1963    | NVBRG     | 120 l/h                             | 80 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0390068     |                         |
| SMG 1964    | NVBRF     | 160 l/h                             | 120 l/h   | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0390069     |                         |
| SMG 1965    | NVBGRP    | 300 l/h                             | 200 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0390070     |                         |
| SMG 1966    | NVBGRM    | 450 l/h                             | 360 l/h   | 1,1 kW       | G 1/2"              | 100               | 38/12               | 0390071     |                         |
| SMG 1967    | NVBGRG    | 600 l/h                             | 480 l/h   | 1,5 kW       | G 1/2"              | 100               | 38/12               | 0390072     |                         |
| SMG 1968    | NVBHRP    | 1000 l/h                            | 600 l/h   | 2,2 kW       | G 3/4"              | 160               | 56/18               | 0390073     |                         |
| SMG 1969    | NVBHRM    | 1500 l/h                            | 1000 l/h  | 3,0 kW       | G 3/4"              | 160               | 56/18               | 0390074     | p <sub>max</sub> 40 bar |
| SMG 1970    | NVBHRG    | 2000 l/h                            | 1400 l/h  | 4,0 kW       | G 3/4"              | 160               | 56/18               | 0390075     |                         |

1) Cyl. Withworth pipe threading; G...A DIN ISO 228

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Series NV; with integrated overflow valve and bypass

### 3.4



| Series size | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |        |      |     |     |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1     | f3   | g   | g1  | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1701    | NVBRP     | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1702    | NVBRM     | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1703    | NVBRG     | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1704    | NVBRF     | 160 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1705    | NVBGRP    | 300 l/h    | 0,18 kW      | 80         | 43 | 100 | 7  | G 1/2" | 35   | 124 | 72  | -   | 63  | 362 | 63  | 163 | 7   | 11   |
| SMG 1706    | NVBGRM    | 450 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 35   | 139 | 72  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1707    | NVBGRG    | 600 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 35   | 139 | 72  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1708    | NVBHRP    | 1000 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 50   | 157 | 105 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1709    | NVBHRM    | 1500 l/h   | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 50   | 157 | 105 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1710    | NVBHRG    | 2000 l/h   | 1,1 kW       | 100        | 49 | 140 | 13 | G 3/4" | 50   | 181 | 105 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
|             |           |            |              |            |    |     |    |        |      |     |     |     |     |     |     |     |     |      |
| SMG 1721    | NVBRP     | 45 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1722    | NVBRM     | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1723    | NVBRG     | 120 l/h    | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1724    | NVBRF     | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 32,5 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1725    | NVBGRP    | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 35   | 139 | 72  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1726    | NVBGRM    | 450 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 35   | 157 | 72  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1727    | NVBGRG    | 600 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 35   | 157 | 72  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1728    | NVBHRP    | 1000 l/h   | 1,5 kW       | 125        | 49 | 140 | 13 | G 3/4" | 50   | 181 | 105 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1729    | NVBHRM    | 1500 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 50   | 202 | 105 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1730    | NVBHRG    | 2000 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 50   | 202 | 105 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
|             |           |            |              |            |    |     |    |        |      |     |     |     |     |     |     |     |     |      |
| SMG 1962    | NVBRM     | 80 l/h     | 0,18 kW      | 80         | 36 | 100 | 7  | G 3/8" | 32,5 | 124 | 67  | -   | 63  | 348 | 63  | 163 | 7   | 11   |
| SMG 1963    | NVBRG     | 120 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 32,5 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1964    | NVBRF     | 160 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 32,5 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1965    | NVGRP     | 300 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 35   | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1966    | NVBGRM    | 450 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 35   | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1967    | NVBGRG    | 600 l/h    | 1,1 kW       | 100        | 43 | 140 | 13 | G 1/2" | 35   | 181 | 75  | -   | 90  | 440 | 92  | 214 | 11  | 13,5 |
| SMG 1968    | NVBHRP    | 1000 l/h   | 2,2 kW       | 140        | 49 | 160 | 14 | G 3/4" | 50   | 202 | 105 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1969    | NVBHRM    | 1500 l/h   | 3,0 kW       | 140        | 49 | 160 | 14 | G 3/4" | 50   | 202 | 105 | 150 | 100 | 595 | 110 | 235 | 13  | 16   |
| SMG 1970    | NVBHRG    | 2000 l/h   | 4,0 kW       | 140        | 49 | 190 | 15 | G 3/4" | 50   | 227 | 105 | 163 | 112 | 617 | 118 | 269 | 13  | 16   |

## hp-Motor pump group; SMG series

3.5

### Series B without overflow valve

Single systems with 950 min<sup>-1</sup> and **hp industrial pumps**.

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 400 cSt. From 400 to 1000 cSt, the motor must be one power stage stronger. Available at a surcharge upon request.

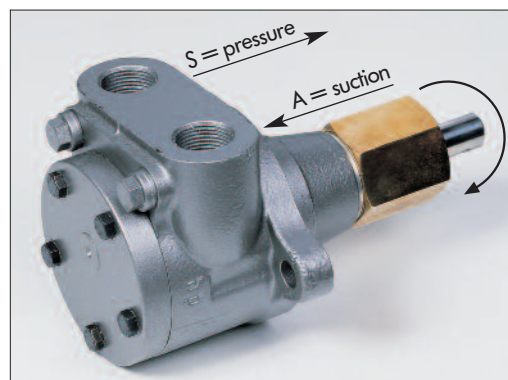
**The pump connections are indicated as follows:**

**A** = suction connection **S** = delivery connection

The standard model of the pumps is designed with a counterclockwise direction of rotation (viewed from the pump shaft). The position of the pump connections is independent of the direction of rotation. (See illustration.)

**Direction of rotation I = counterclockwise, standard model**

For clockwise rotation, D, the connections A = suction and S = delivery are interchanged



| Series size | Pump type | Discharge at 950 min <sup>-1</sup> |           | Motor output | Connections<br>1) * | H1 Heater<br>Watt | Gear<br>rotor/shaft | Article-no. |                         |
|-------------|-----------|------------------------------------|-----------|--------------|---------------------|-------------------|---------------------|-------------|-------------------------|
|             |           | at 0 - 9 bar                       | at 30 bar |              |                     |                   |                     |             |                         |
| SMG 1801    | BP        | 30 l/h                             | -         | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380001     | p <sub>max</sub> 9 bar  |
| SMG 1802    | BM        | 55 l/h                             | -         | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380002     |                         |
| SMG 1803    | BG        | 80 l/h                             | -         | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380003     |                         |
| SMG 1804    | BF        | 105 l/h                            | -         | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380004     |                         |
| SMG 1805    | BGP       | 200 l/h                            | -         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0380005     |                         |
| SMG 1806    | BGM       | 300 l/h                            | -         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0380006     |                         |
| SMG 1807    | BGG       | 400 l/h                            | -         | 0,37 kW      | G 1/2"              | 100               | 38/12               | 0380007     |                         |
| SMG 1808    | BHP       | 670 l/h                            | -         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0380008     | p <sub>max</sub> 9 bar  |
| SMG 1809    | BHM       | 1000 l/h                           | -         | 0,75 kW      | G 3/4"              | 160               | 56/18               | 0380009     |                         |
| SMG 1810    | BHG       | 1330 l/h                           | -         | 1,1 kW       | G 3/4"              | 160               | 56/18               | 0380010     |                         |
| SMG 1811    | BHGP      | 2000 l/h                           | -         | 1,5 kW       | G 1 1/2"            | 280               | 75/22               | 0380011     |                         |
| SMG 1812    | BHGM      | 3000 l/h                           | -         | 2,2 kW       | G 1 1/2"            | 280               | 75/22               | 0380012     |                         |
| SMG 1813    | BHGG      | 4000 l/h                           | -         | 3,0 kW       | G 1 1/2"            | 280               | 75/22               | 0380013     |                         |
| SMG 1821    | BP        | 30 l/h                             | 20 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380014     | p <sub>max</sub> 30 bar |
| SMG 1822    | BM        | 55 l/h                             | 40 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380015     |                         |
| SMG 1823    | BG        | 80 l/h                             | 60 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380016     |                         |
| SMG 1824    | BF        | 105 l/h                            | 90 l/h    | 0,37 kW      | G 3/8"              | 100               | 25/12               | 0380017     |                         |
| SMG 1825    | BGP       | 200 l/h                            | 160 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0380018     |                         |
| SMG 1826    | BGM       | 300 l/h                            | 260 l/h   | 0,75 kW      | G 1/2"              | 100               | 38/12               | 0380019     |                         |
| SMG 1827    | BGG       | 400 l/h                            | 360 l/h   | 1,1 kW       | G 1/2"              | 100               | 38/12               | 0380020     |                         |
| SMG 1828    | BHP       | 670 l/h                            | 470 l/h   | 1,5 kW       | G 3/4"              | 160               | 56/18               | 0380021     |                         |
| SMG 1829    | BHM       | 1000 l/h                           | 800 l/h   | 2,2 kW       | G 3/4"              | 160               | 56/18               | 0380022     |                         |
| SMG 1830    | BHG       | 1330 l/h                           | 1100 l/h  | 3,0 kW       | G 3/4"              | 160               | 56/18               | 0380023     |                         |
| SMG 1831    | BHGP      | 2000 l/h                           | 1400 l/h  | 4,0 kW       | G 1 1/2"            | 280               | 75/22               | 0380024     |                         |
| SMG 1832    | BHGM      | 3000 l/h                           | 2400 l/h  | 5,5 kW       | G 1 1/2"            | 280               | 75/22               | 0380025     |                         |
| SMG 1833    | BHGG      | 4000 l/h                           | 3200 l/h  | 7,5 kW       | G 1 1/2"            | 280               | 75/22               | 0380026     |                         |

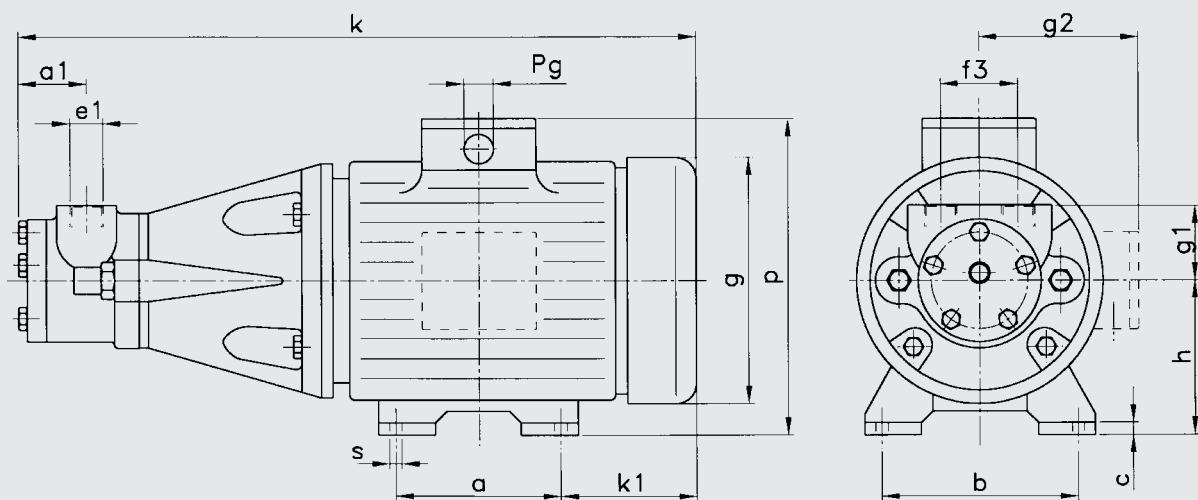
1) Cyl. Withworth Pipe Threading: G...A DIN ISO 228

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.



## Series B; without overflow valve

3.5



| Series size | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |          |     |     |    |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|----------|-----|-----|----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1       | f3  | g   | g1 | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1801    | BP        | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1802    | BM        | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1803    | BG        | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1804    | BF        | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1805    | BGP       | 200 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2"   | 44  | 139 | 43 | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1806    | BGM       | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2"   | 44  | 139 | 43 | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1807    | BGG       | 400 l/h    | 0,37 kW      | 100        | 43 | 125 | 8  | G 1/2"   | 44  | 157 | 43 | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1808    | BHP       | 670 l/h    | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4"   | 67  | 157 | 65 | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1809    | BHM       | 1000 l/h   | 0,75 kW      | 100        | 49 | 140 | 13 | G 3/4"   | 67  | 181 | 65 | 137 | 90  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1810    | BHG       | 1330 l/h   | 1,1 kW       | 125        | 49 | 140 | 13 | G 3/4"   | 67  | 181 | 65 | 137 | 90  | 556 | 95  | 214 | 11  | 13,5 |
| SMG 1811    | BHGP      | 2000 l/h   | 1,5 kW       | 140        | 65 | 160 | 14 | G 1 1/2" | 100 | 202 | 90 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1812    | BHGM      | 3000 l/h   | 2,2 kW       | 140        | 65 | 190 | 15 | G 1 1/2" | 100 | 227 | 90 | 163 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1813    | BHGG      | 4000 l/h   | 3,0 kW       | 140        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
|             |           |            |              |            |    |     |    |          |     |     |    |     |     |     |     |     |     |      |
| SMG 1821    | BP        | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1822    | BM        | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1823    | BG        | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1824    | BF        | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8"   | 38  | 139 | 43 | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1825    | BGP       | 200 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2"   | 44  | 157 | 43 | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1826    | BGM       | 300 l/h    | 0,75 kW      | 100        | 43 | 140 | 13 | G 1/2"   | 44  | 181 | 43 | 137 | 90  | 458 | 92  | 214 | 11  | 13,5 |
| SMG 1827    | BGG       | 400 l/h    | 1,1 kW       | 125        | 43 | 140 | 13 | G 1/2"   | 44  | 181 | 43 | 137 | 90  | 483 | 95  | 214 | 11  | 13,5 |
| SMG 1828    | BHP       | 670 l/h    | 1,5 kW       | 140        | 49 | 160 | 14 | G 3/4"   | 67  | 202 | 65 | 150 | 100 | 595 | 103 | 235 | 13  | 16   |
| SMG 1829    | BHM       | 1000 l/h   | 2,2 kW       | 140        | 49 | 190 | 15 | G 3/4"   | 67  | 227 | 65 | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1830    | BHG       | 1330 l/h   | 3,0 kW       | 140        | 49 | 216 | 17 | G 3/4"   | 67  | 267 | 65 | 189 | 132 | 678 | 140 | 308 | 13  | 21   |
| SMG 1831    | BHGP      | 2000 l/h   | 4,0 kW       | 178        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1832    | BHGM      | 3000 l/h   | 5,5 kW       | 178        | 65 | 216 | 17 | G 1 1/2" | 100 | 267 | 90 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1833    | BHGG      | 4000 l/h   | 7,5 kW       | 210        | 65 | 254 | 20 | G 1 1/2" | 100 | 324 | 90 | 209 | 160 | 877 | 157 | 366 | 16  | 21   |



## hp-Motor pump group; SMG series

3.6

### Series VB with integrated overflow valve

Single system with 950 min<sup>-1</sup> and **hp industrial pumps**.

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 400 cSt. From 400 to 1000 cSt, the motor must be one power stage stronger. Available at a surcharge upon request.

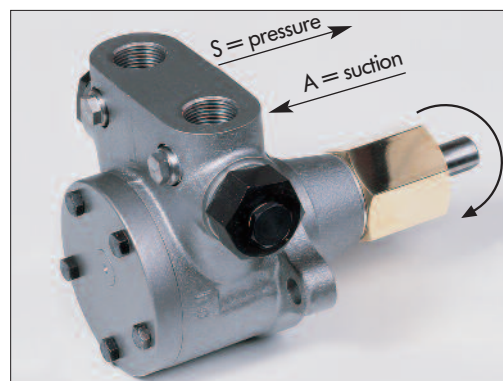
**The pump connections are indicated as follows:**

**A** = suction connection **S** = delivery connection

The standard model of the pumps is designed with a counterclockwise direction of rotation (viewed from the pump shaft). The position of the pump connections is independent of the direction of rotation. (See illustration.)

**Direction of rotation I = counterclockwise, standard model**

For clockwise rotation, D, the oil connections A = suction and S = delivery are interchanged



| Series size | Pump type | Discharge at 950 min <sup>-1</sup> |           | Motor output | Connections* | H1 Heater Watt | Gear rotor/shaft | Article-no. |                         |
|-------------|-----------|------------------------------------|-----------|--------------|--------------|----------------|------------------|-------------|-------------------------|
|             |           | at 0 - 9 bar                       | at 30 bar |              |              |                |                  |             |                         |
| SMG 1841    | VBP       | 30 l/h                             | -         | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380027     | p <sub>max</sub> 9 bar  |
| SMG 1842    | VBM       | 55 l/h                             | -         | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380028     |                         |
| SMG 1843    | VBG       | 80 l/h                             | -         | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380029     |                         |
| SMG 1844    | VBF       | 105 l/h                            | -         | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380030     |                         |
| SMG 1845    | VBGP      | 200 l/h                            | -         | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0380031     |                         |
| SMG 1846    | VBGM      | 300 l/h                            | -         | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0380032     |                         |
| SMG 1847    | VBGG      | 400 l/h                            | -         | 0,37 kW      | G 1/2"       | 100            | 38/12            | 0380033     |                         |
| SMG 1848    | VBHP      | 670 l/h                            | -         | 0,75 kW      | G 3/4"       | 160            | 56/18            | 0380034     |                         |
| SMG 1849    | VBHM      | 1000 l/h                           | -         | 0,75 kW      | G 3/4"       | 160            | 56/18            | 0380035     |                         |
| SMG 1850    | VBHG      | 1330 l/h                           | -         | 1,1 kW       | G 3/4"       | 160            | 56/18            | 0380036     |                         |
| SMG 1851    | VBHGP     | 2000 l/h                           | -         | 1,5 kW       | G 1"         | 280            | 75/22            | 0380037     |                         |
| SMG 1852    | VBHGM     | 3000 l/h                           | -         | 2,2 kW       | G 1"         | 280            | 75/22            | 0380038     |                         |
| SMG 1853    | VBHGG     | 4000 l/h                           | -         | 3,0 kW       | G 1"         | 280            | 75/22            | 0380039     |                         |
| SMG 1861    | VBP       | 30 l/h                             | 20 l/h    | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380040     | p <sub>max</sub> 30 bar |
| SMG 1862    | VBM       | 55 l/h                             | 40 l/h    | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380041     |                         |
| SMG 1863    | VBG       | 80 l/h                             | 60 l/h    | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380042     |                         |
| SMG 1864    | VBF       | 105 l/h                            | 90 l/h    | 0,37 kW      | G 3/8"       | 100            | 25/12            | 0380043     |                         |
| SMG 1865    | VBGP      | 200 l/h                            | 160 l/h   | 0,75 kW      | G 1/2"       | 100            | 38/12            | 0380044     |                         |
| SMG 1866    | VBGM      | 300 l/h                            | 260 l/h   | 0,75 kW      | G 1/2"       | 100            | 38/12            | 0380045     |                         |
| SMG 1867    | VBGG      | 400 l/h                            | 360 l/h   | 1,1 kW       | G 1/2"       | 100            | 38/12            | 0380046     |                         |
| SMG 1868    | VBHP      | 670 l/h                            | 470 l/h   | 1,5 kW       | G 3/4"       | 160            | 56/18            | 0380047     |                         |
| SMG 1869    | VBHM      | 1000 l/h                           | 800 l/h   | 2,2 kW       | G 3/4"       | 160            | 56/18            | 0380048     |                         |
| SMG 1870    | VBHG      | 1330 l/h                           | 1100 l/h  | 3,0 kW       | G 3/4"       | 160            | 56/18            | 0380049     |                         |
| SMG 1871    | VBHGP     | 2000 l/h                           | 1400 l/h  | 4,0 kW       | G 1"         | 280            | 75/22            | 0380050     |                         |
| SMG 1872    | VBHGM     | 3000 l/h                           | 2400 l/h  | 5,5 kW       | G 1"         | 280            | 75/22            | 0380051     |                         |
| SMG 1873    | VBHGG     | 4000 l/h                           | 3200 l/h  | 7,5 kW       | G 1"         | 280            | 75/22            | 0380052     |                         |

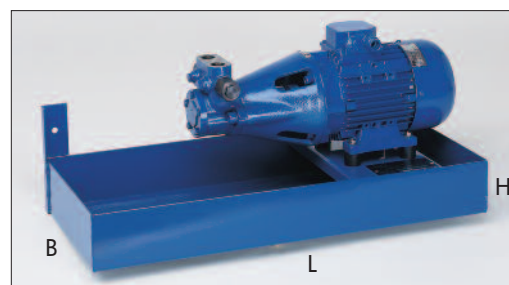
### Accessory

„WA“ = oil pan and anti-vibration pads for mounting on the wall

„LH“ = oil leakage warning device has passed WHG and TÜV inspections.

Also suitable for later installation on already installed aggregates to meet new regulations.

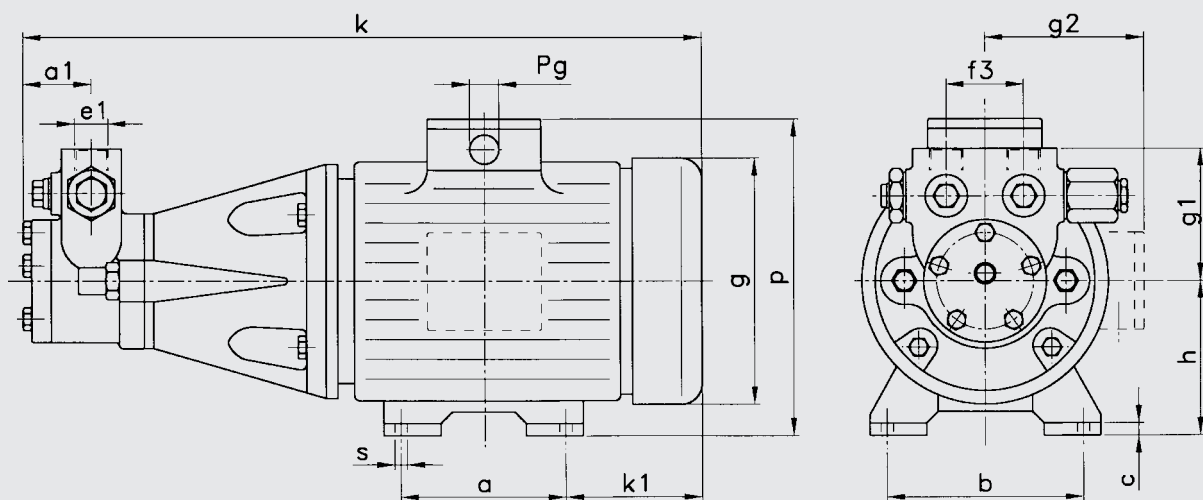
| Gear rotor/shaft                          | Pan dimensions mm |     |    | Article-no. |
|-------------------------------------------|-------------------|-----|----|-------------|
|                                           | L                 | B   | H  |             |
| 25/12 + 38/12                             | 600               | 270 | 80 | 0820502     |
| 56/18                                     | 840               | 270 | 80 | 0820504     |
| 75/22                                     | 1050              | 360 | 80 | 0850065     |
| Fuel oil warning decide Type HMS at 230 V |                   |     |    | 0720701     |
| Fuel oil warning decide Type HMW          |                   |     |    | 0720705     |



\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Series VB; with integrated overflow valve

3.6



| Size series | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|--------|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1     | f3 | g   | g1  | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1841    | VBP       | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1842    | VBM       | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1843    | VBG       | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1844    | VBF       | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1845    | VGBP      | 200 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1846    | VBGM      | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1847    | VBGG      | 400 l/h    | 0,37 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1848    | VBHP      | 670 l/h    | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 90  | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1849    | VBHM      | 1000 l/h   | 0,75 kW      | 100        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 80  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1850    | VBHG      | 1330 l/h   | 1,1 kW       | 125        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 90  | 556 | 95  | 214 | 11  | 13,5 |
| SMG 1851    | VBHGP     | 2000 l/h   | 1,5 kW       | 140        | 65 | 160 | 14 | G 1"   | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1852    | VBHGM     | 3000 l/h   | 2,2 kW       | 140        | 65 | 190 | 15 | G 1"   | 80 | 227 | 120 | 163 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1853    | VBHGG     | 4000 l/h   | 3,0 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
|             |           |            |              |            |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
| SMG 1861    | VBP       | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1862    | VBM       | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1863    | VBG       | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1864    | VBF       | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1865    | VGBP      | 200 l/h    | 0,75 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1866    | VBGM      | 300 l/h    | 0,75 kW      | 100        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | 137 | 90  | 458 | 92  | 214 | 11  | 13,5 |
| SMG 1867    | VBGG      | 400 l/h    | 1,1 kW       | 125        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | 137 | 90  | 483 | 95  | 214 | 11  | 13,5 |
| SMG 1868    | VBHP      | 670 l/h    | 1,5 kW       | 140        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 90  | 150 | 100 | 595 | 103 | 235 | 13  | 16   |
| SMG 1869    | VBHM      | 1000 l/h   | 2,2 kW       | 140        | 49 | 190 | 15 | G 3/4" | 67 | 227 | 90  | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1870    | VBHG      | 1330 l/h   | 3,0 kW       | 140        | 49 | 216 | 17 | G 3/4" | 67 | 267 | 90  | 189 | 132 | 678 | 140 | 308 | 13  | 21   |
| SMG 1871    | VBHGP     | 2000 l/h   | 4,0 kW       | 178        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1872    | VBHGM     | 3000 l/h   | 5,5 kW       | 178        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1873    | VBHGG     | 4000 l/h   | 7,5 kW       | 210        | 65 | 254 | 20 | G 1"   | 80 | 324 | 120 | 209 | 160 | 877 | 157 | 366 | 16  | 21   |

## hp-Motor pump group; SMG series

3.7

### Series VBR with integrated overflow valve and bypass

Single system with 950 min<sup>-1</sup> and **hp industrial pumps**.

Suitable for use with hydraulic oils, lubricating oils, all fuel oils, coal and lignite tar oils, kerosene and many other self-lubricating fluids. The motor output data applies for fluids with a viscosity of up to 400 cSt. From 400 to 1000 cSt, the motor must be one power stage stronger. Available at a surcharge upon request.

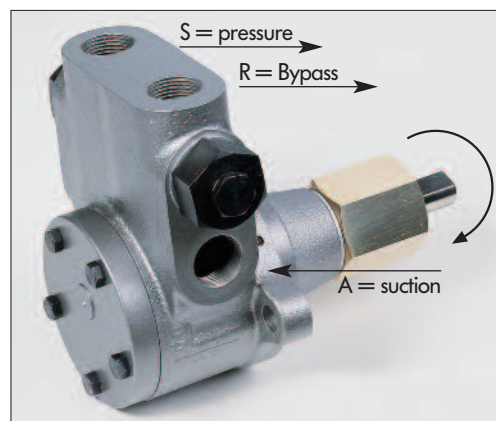
**The pump connections are indicated as follows:**

**A** = suction connection    **S** = delivery connection    **R** = bypass connection

The standard models of the pumps are designed with a counterclockwise direction of rotation (viewed from the pump shaft). The position of the pump connections is independent of the direction of rotation. (See illustration.)

**Direction of rotation I = counterclockwise, standard model**

For clockwise rotation, D, the oil connections S = delivery and R = bypass are interchanged. The suction connection A = suction is found on the other side.

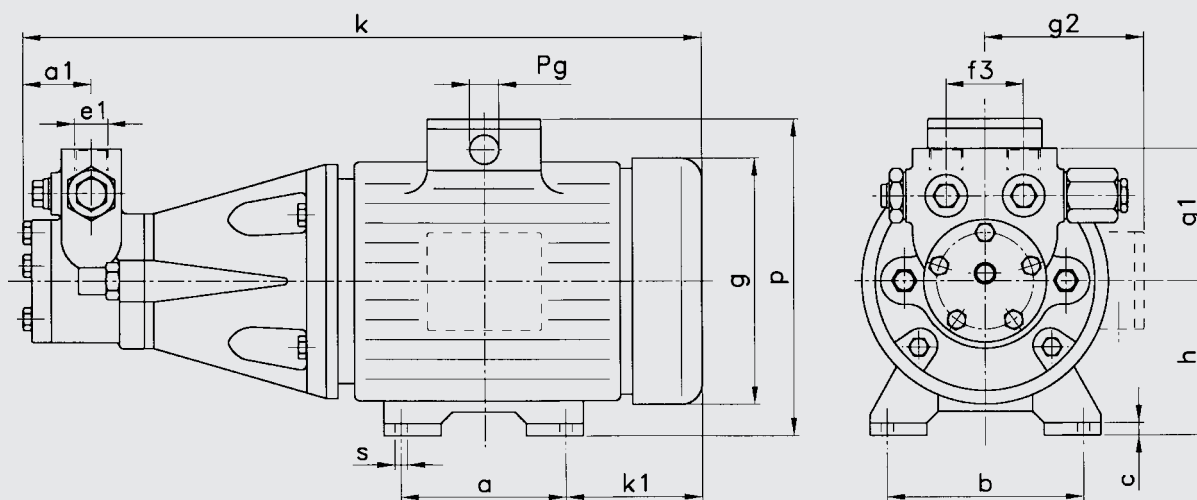


| Series size | Pump type | Discharge at 950 min <sup>-1</sup> |            | Motor output | Connections*       | H1 Heater Watt | Gear rotor/shaft | Article-no. |                         |
|-------------|-----------|------------------------------------|------------|--------------|--------------------|----------------|------------------|-------------|-------------------------|
|             |           | bei 0 - 9 bar                      | bei 30 bar |              |                    |                |                  |             |                         |
| SMG 1881    | VBRP      | 30 l/h                             | -          | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380061     | p <sub>max</sub> 9 bar  |
| SMG 1882    | VBRM      | 55 l/h                             | -          | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380062     |                         |
| SMG 1883    | VBRG      | 80 l/h                             | -          | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380063     |                         |
| SMG 1884    | VBRF      | 105 l/h                            | -          | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380064     |                         |
| SMG 1885    | VBGRP     | 200 l/h                            | -          | 0,37 kW      | G 1/2"             | 100            | 38/12            | 0380065     |                         |
| SMG 1886    | VBGRM     | 300 l/h                            | -          | 0,37 kW      | G 1/2"             | 100            | 38/12            | 0380066     |                         |
| SMG 1887    | VBGRG     | 400 l/h                            | -          | 0,37 kW      | G 1/2"             | 100            | 38/12            | 0380067     |                         |
| SMG 1888    | VBHRP     | 670 l/h                            | -          | 0,75 kW      | G 3/4"             | 160            | 56/18            | 0380068     |                         |
| SMG 1889    | VBHRM     | 1000 l/h                           | -          | 0,75 kW      | G 3/4"             | 160            | 56/18            | 0380069     |                         |
| SMG 1890    | VBHRG     | 1330 l/h                           | -          | 1,1 kW       | G 3/4"             | 160            | 56/18            | 0380070     |                         |
| SMG 1891    | VBHGRP    | 2000 l/h                           | -          | 1,5 kW       | G 1" <sup>1)</sup> | 280            | 75/22            | 0380071     |                         |
| SMG 1892    | VBHGRM    | 3000 l/h                           | -          | 2,2 kW       | G 1" <sup>1)</sup> | 280            | 75/22            | 0380072     |                         |
| SMG 1893    | VBHGRG    | 4000 l/h                           | -          | 3,0 kW       | G 1" <sup>1)</sup> | 280            | 75/22            | 0380073     | p <sub>max</sub> 30 bar |
| SMG 1881-25 | VBRP      | 30 l/h                             | 20 l/h     | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380040     |                         |
| SMG 1882-25 | VBRM      | 55 l/h                             | 40 l/h     | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380041     |                         |
| SMG 1883-25 | VBRG      | 80 l/h                             | 60 l/h     | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380042     |                         |
| SMG 1884-25 | VBRF      | 105 l/h                            | 90 l/h     | 0,37 kW      | G 3/8"             | 100            | 25/12            | 0380043     |                         |
| SMG 1885-25 | VBGRP     | 200 l/h                            | 160 l/h    | 0,75 kW      | G 1/2"             | 100            | 38/12            | 0380044     |                         |
| SMG 1886-25 | VBGRM     | 300 l/h                            | 260 l/h    | 0,75 kW      | G 1/2"             | 100            | 38/12            | 0380045     |                         |
| SMG 1887-25 | VBGRG     | 400 l/h                            | 360 l/h    | 1,1 kW       | G 1/2"             | 100            | 38/12            | 0380046     |                         |
| SMG 1888-25 | VBHRP     | 670 l/h                            | 470 l/h    | 1,5 kW       | G 3/4"             | 160            | 56/18            | 0380047     |                         |
| SMG 1889-25 | VBHRM     | 1000 l/h                           | 800 l/h    | 2,2 kW       | G 3/4"             | 160            | 56/18            | 0380048     |                         |
| SMG 1890-25 | VBHRG     | 1330 l/h                           | 1100 l/h   | 3,0 kW       | G 3/4"             | 160            | 56/18            | 0380049     |                         |
| SMG 1891-25 | VBHGRP    | 2000 l/h                           | 1400 l/h   | 4,0 kW       | G 1"               | 280            | 75/22            | 0380050     |                         |
| SMG 1892-25 | VBHGRM    | 3000 l/h                           | 2400 l/h   | 5,5 kW       | G 1"               | 280            | 75/22            | 0380051     |                         |
| SMG 1893-25 | VBHGRG    | 4000 l/h                           | 3200 l/h   | 7,5 kW       | G 1"               | 280            | 75/22            | 0380052     |                         |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## Series VBR; with integrated overflow valves and bypass

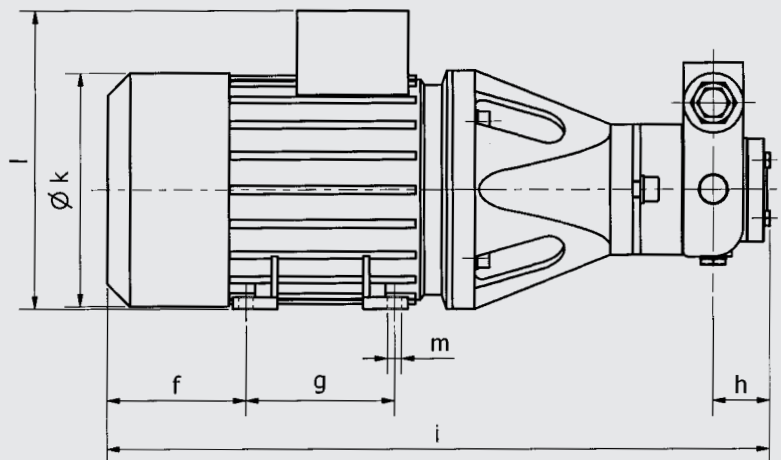
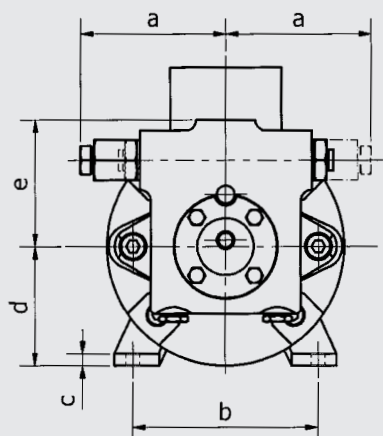
### 3.7



| Size series | Pump type | Dis-charge | Motor output | Dimensions |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
|-------------|-----------|------------|--------------|------------|----|-----|----|--------|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|             |           |            |              | a          | a1 | b   | c  | e1     | f3 | g   | g1  | g2  | h   | k   | k1  | p   | s   | Pg   |
| SMG 1881    | VBRP      | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1882    | VBRM      | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1883    | VBRG      | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1884    | VBRF      | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1885    | VBGRP     | 200 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1886    | VBGRM     | 300 l/h    | 0,37 kW      | 90         | 43 | 112 | 7  | G 1/2" | 44 | 139 | 75  | -   | 71  | 390 | 69  | 180 | 7   | 11   |
| SMG 1887    | VBGRG     | 400 l/h    | 0,37 kW      | 100        | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1888    | VBHRP     | 670 l/h    | 0,75 kW      | 100        | 49 | 125 | 8  | G 3/4" | 67 | 157 | 90  | -   | 80  | 496 | 77  | 197 | 9,5 | 11   |
| SMG 1889    | VBHRM     | 1000 l/h   | 0,75 kW      | 100        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 80  | 531 | 92  | 214 | 11  | 13,5 |
| SMG 1890    | VBHRG     | 1330 l/h   | 1,1 kW       | 125        | 49 | 140 | 13 | G 3/4" | 67 | 181 | 90  | 137 | 90  | 556 | 95  | 214 | 11  | 13,5 |
| SMG 1891    | VBHGRP    | 2000 l/h   | 1,5 kW       | 140        | 65 | 160 | 14 | G 1"   | 80 | 202 | 120 | 150 | 100 | 657 | 103 | 235 | 13  | 16   |
| SMG 1892    | VBHGRM    | 3000 l/h   | 2,2 kW       | 140        | 65 | 190 | 15 | G 1"   | 80 | 227 | 120 | 163 | 112 | 679 | 118 | 269 | 13  | 16   |
| SMG 1893    | VBHGRG    | 4000 l/h   | 3,0 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 740 | 140 | 308 | 13  | 21   |
|             |           |            |              |            |    |     |    |        |    |     |     |     |     |     |     |     |     |      |
| SMG 1881-25 | VBRP      | 30 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1882-25 | VBRM      | 55 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1883-25 | VBRG      | 80 l/h     | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1884-25 | VBRF      | 105 l/h    | 0,37 kW      | 90         | 36 | 112 | 7  | G 3/8" | 38 | 139 | 67  | -   | 71  | 376 | 69  | 180 | 7   | 11   |
| SMG 1885-25 | VBGRP     | 200 l/h    | 0,75 kW      | 90         | 43 | 125 | 8  | G 1/2" | 44 | 157 | 75  | -   | 80  | 423 | 77  | 197 | 9,5 | 11   |
| SMG 1886-25 | VBGRM     | 300 l/h    | 0,75 kW      | 90         | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | 137 | 90  | 458 | 92  | 214 | 11  | 13,5 |
| SMG 1887-25 | VBGRG     | 400 l/h    | 1,1 kW       | 100        | 43 | 140 | 13 | G 1/2" | 44 | 181 | 75  | 137 | 90  | 483 | 95  | 214 | 11  | 13,5 |
| SMG 1888-25 | VBHRP     | 670 l/h    | 1,5 kW       | 100        | 49 | 160 | 14 | G 3/4" | 67 | 202 | 90  | 150 | 100 | 595 | 103 | 235 | 13  | 16   |
| SMG 1889-25 | VBHRM     | 1000 l/h   | 2,2 kW       | 100        | 49 | 190 | 15 | G 3/4" | 67 | 227 | 90  | 163 | 112 | 617 | 118 | 269 | 13  | 16   |
| SMG 1890-25 | VBHRG     | 1330 l/h   | 3,0 kW       | 125        | 49 | 216 | 17 | G 3/4" | 67 | 267 | 90  | 189 | 132 | 678 | 140 | 308 | 13  | 21   |
| SMG 1891-25 | VBHGRP    | 2000 l/h   | 4,0 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1892-25 | VBHGRM    | 3000 l/h   | 5,5 kW       | 140        | 65 | 216 | 17 | G 1"   | 80 | 267 | 120 | 189 | 132 | 778 | 140 | 308 | 13  | 21   |
| SMG 1893-25 | VBHGRG    | 4000 l/h   | 7,5 kW       | 140        | 65 | 254 | 20 | G 1"   | 80 | 324 | 120 | 209 | 160 | 877 | 157 | 366 | 16  | 21   |

## hp-Motor pump group; UMG series

3.8



### for 1400 rpm

| Series size | Pump type | Discharge at |        |        | Motor output   | Art.-no. | Thread connection for (S/A/R) | a  | b   | c  | d  | e  | f   | g   | h  | i   | k   | l   | m   |
|-------------|-----------|--------------|--------|--------|----------------|----------|-------------------------------|----|-----|----|----|----|-----|-----|----|-----|-----|-----|-----|
|             |           | 9 bar        | 30 bar | 40 bar |                |          |                               |    |     |    |    |    |     |     |    |     |     |     |     |
| UMG 1101    | UHE-A2-PZ | 200          | -      | -      | 0,37 kW/BG 71  | 03905001 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 410 | 139 | 182 | 7   |
| UMG 1102    | UHE-A3-P  | 300          | -      | -      | 0,37 kW/BG 71  | 03905005 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 414 | 139 | 182 | 7   |
| UMG 1103    | UHE-A4-M  | 450          | -      | -      | 0,37 kW/BG 71  | 03905010 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 418 | 139 | 182 | 7   |
| UMG 1104    | UHE-A5-GZ | 550          | -      | -      | 0,37 kW/BG 71  | 03905015 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 424 | 139 | 182 | 7   |
| UMG 1105    | UHE-A2-PZ | -            | 155    | -      | 0,55 kW/BG 80  | 03905002 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 442 | 157 | 200 | 9,5 |
| UMG 1106    | UHE-A3-P  | -            | 260    | -      | 0,55 kW/BG 80  | 03905006 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 446 | 157 | 200 | 9,5 |
| UMG 1107    | UHE-A4-M  | -            | 425    | -      | 0,75 kW/BG 80  | 03905011 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 450 | 157 | 200 | 9,5 |
| UMG 1108    | UHE-A5-GZ | -            | 500    | -      | 0,75 kW/BG 80  | 03905016 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 456 | 157 | 200 | 9,5 |
| UMG 1109    | UHE-A2-PZ | -            | -      | 140    | 0,55 kW/BG 80  | 03905003 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 442 | 157 | 200 | 9,5 |
| UMG 1110    | UHE-A3-P  | -            | -      | 240    | 0,75 kW/BG 80  | 03905007 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 446 | 157 | 200 | 9,5 |
| UMG 1111    | UHE-A4-M  | -            | -      | 390    | 1,1 kW/BG 90 S | 03905012 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 125 | 100 | 38 | 508 | 174 | 218 | 10  |
| UMG 1112    | UHE-A5-GZ | -            | -      | 450    | 1,1 kW/BG 90 S | 03905017 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 125 | 100 | 38 | 514 | 174 | 218 | 10  |

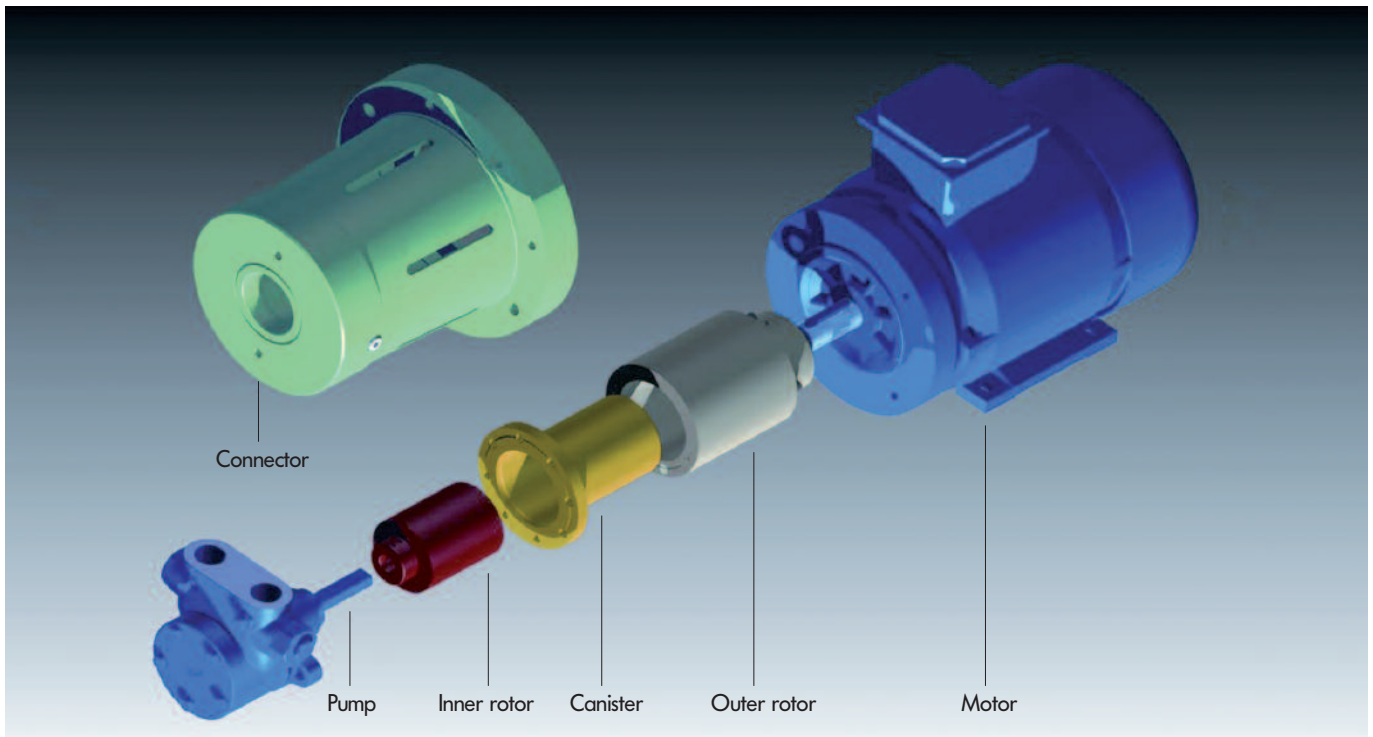
### for 2800 rpm

| Series size | Pump type | Discharge at |        |        | Motor output   | Art.-no. | Thread connection for (S/A/R) | a  | b   | c  | d  | e  | f   | g   | h  | i   | k   | l   | m   |
|-------------|-----------|--------------|--------|--------|----------------|----------|-------------------------------|----|-----|----|----|----|-----|-----|----|-----|-----|-----|-----|
|             |           | 9 bar        | 30 bar | 40 bar |                |          |                               |    |     |    |    |    |     |     |    |     |     |     |     |
| UMG 1201    | UHE-A2-PZ | 500          | -      | -      | 0,37 kW/BG 71  | 03905201 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 410 | 139 | 182 | 7   |
| UMG 1202    | UHE-A3-P  | 700          | -      | -      | 0,37 kW/BG 71  | 03905205 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 414 | 139 | 182 | 7   |
| UMG 1203    | UHE-A4-M  | 900          | -      | -      | 0,55 kW/BG 80  | 03905210 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 418 | 139 | 182 | 7   |
| UMG 1204    | UHE-A5-GZ | 1300         | -      | -      | 0,55 kW/BG 80  | 03905215 | G1/2"                         | 98 | 112 | 7  | 71 | 85 | 82  | 90  | 38 | 424 | 139 | 182 | 7   |
| UMG 1205    | UHE-A2-PZ | -            | 380    | -      | 0,75 kW/BG 80  | 03905202 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 442 | 157 | 200 | 9,5 |
| UMG 1206    | UHE-A3-P  | -            | 600    | -      | 1,1 kW/BG 80   | 03905206 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 446 | 157 | 200 | 9,5 |
| UMG 1207    | UHE-A4-M  | -            | 850    | -      | 1,5 kW/BG 90 S | 03905211 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 125 | 100 | 38 | 508 | 174 | 218 | 10  |
| UMG 1208    | UHE-A5-GZ | -            | 1150   | -      | 2,2 kW/BG 90 L | 03905216 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 100 | 125 | 38 | 514 | 174 | 218 | 10  |
| UMG 1209    | UHE-A2-PZ | -            | -      | 330    | 1,1 kW/BG 80   | 03905203 | G1/2"                         | 98 | 125 | 8  | 80 | 85 | 94  | 100 | 38 | 442 | 157 | 200 | 9,5 |
| UMG 1210    | UHE-A3-P  | -            | -      | 550    | 1,5 kW/BG 90 S | 03905207 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 125 | 100 | 38 | 504 | 174 | 218 | 10  |
| UMG 1211    | UHE-A4-M  | -            | -      | 800    | 2,2 kW/BG 90 L | 03905212 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 100 | 125 | 38 | 508 | 174 | 218 | 10  |
| UMG 1212    | UHE-A5-GZ | -            | -      | 1050   | 2,2 kW/BG 90 L | 03905217 | G1/2"                         | 98 | 140 | 10 | 90 | 85 | 100 | 125 | 38 | 514 | 174 | 218 | 10  |



## hp-Motor pump group with MaG-Drive

3.9



### hp-MaG-Drive

- **hp-MaG-Drive is 100% free of leakage**
- **A magnetic field will be synchronized, so that pump can be restarted again**
- **A special alloy guarantees a stable magnetic field within a wide range of temperature**
- **All hp-SMG motor pump groups can be refitted in our plant with a kit**

### Never again damages caused by defective mechanical seals

Until now mechanical seals had to be replaced in regular intervals or due to a defect untimely. The lifecycle costs were one significant factor in case of buying a pump. These times are all over now! Our hp-MaG-Drive is 100% free of leakage. Maintenance or repairs of the usual mechanical seal will definitely be a thing of the past.

The non-contact transmission of rotation assures additional safety by a non-destructive mechanical isolation in case of overcharge or blockades. As soon as the motor has been switched off, the magnetic field will be synchronized so that pump can be restarted again.

The implementation of permanent magnets out of a special alloy of samarium and cobalt guarantees a stable magnetic field within a wide range of temperature as well as a long period of time.

All hp-motor pump groups of the SMG-series will be available with our hp-MaG-Drive or can be refitted in our plant with a kit within a short period of time. The connecting dimensions of the usual SMG will not change.

Beside all the named advantages the environmental protection takes the center stage in our development work. Protecting our environment from damages by our products – for instance caused by unnoticed leakage of polluting media – we will increase our efforts in the further developing of our hp-products.

### Operational conditions:

Self-lubricating media with a viscosity from 5-500 mm<sup>2</sup>/s

Flow rate:  
160-6000 l/h

Pressure <sub>max.</sub>:  
40 bar

Torsional moment <sub>max.</sub>:  
80 Nm



All hp-Assemblies can be refitted with the hp-MaG-Drive



## hp-Pressure-vessel aggregate (for lower capacity)

4.0

### Type: Ölman®

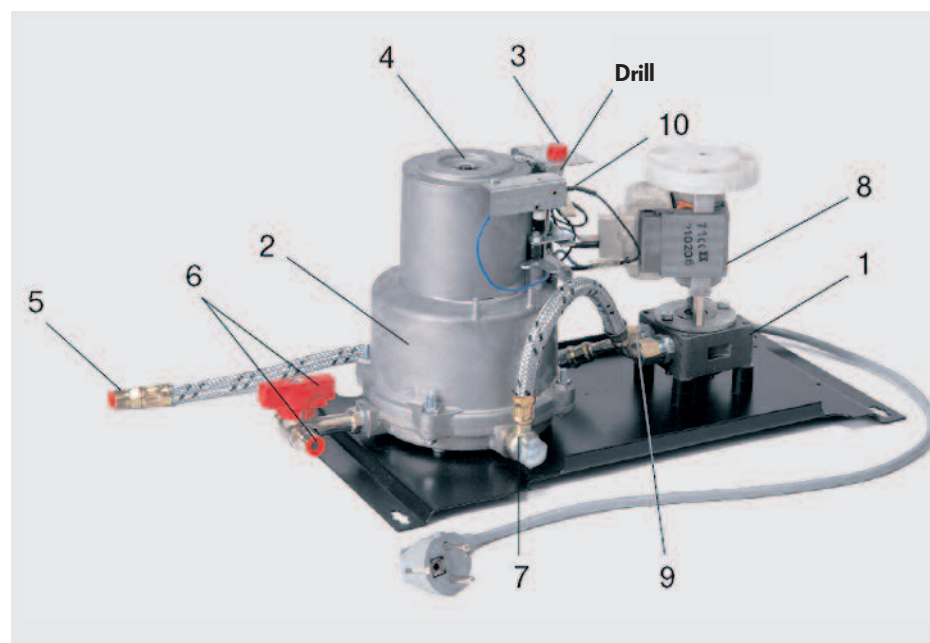
Tested in accordance with DIN/EN 12514-1.

**Heating oil pump:** Peripheral pump is driven by a robust motor provided with an excess temperature cut-out. The upper safety pressure limit in accordance with DIN/EN 12514-1 is reached by means of a micro limit switch which is interlocked with the controller. A reset may only be carried out by a specialist, the reason for the safety switch-off has to be examined.

**Filter:** Situated in the suction plant stub, can be removed for cleaning.

**Non-return valve:** Situated in the pressure connection stub on the pressure vessel.

**Pressure vessel:** Of aluminium construction. Inside is a rolling membrane made of special rubber with fabric reinforcement (operating pressure up to 7 bar) and a piston with which the pump pressure is determined. The indicator button shows contents of the vessel at any one time. The safety and operating switches with silver contacts are thoroughly fastened on the pressure vessel and provided with a plug connector.



### Packing list:

- 1 Heating oil pump
- 2 Pressure vessel
- 3 Indicator lamp / starter
- 4 Indicator button
- 5 Suction connection for 8 mm Ø pipe
- 6 Changeover valve (with throttle valve) pressure connection for 8 mm Ø pipe or for venting or emptying
- 7 Non-return valve
- 8 Motor with excess temperature cut-out
- 9 Filter stub
- 10 Safety pressure limiter with reset

### Technical data:

|                         |                              |
|-------------------------|------------------------------|
| Pumped volume:          | 30 l/h                       |
| Pressure height:        | 16 m                         |
| Suction height:         | 4 m                          |
| Operating pressure:     | 2.5 bar                      |
| Suction-/Pressure pipe: | 8 mm Pipe - Ø                |
| Motor:                  | 220V 50 Hz, maintenance free |
| Protection:             | DIN 40050 T.1                |
| Length:                 | 400 mm                       |
| Width, height:          | 200 mm                       |
| Weight:                 | 6.5 kg                       |



- 2 years guarantee
- low noise
- variable installation
- excess temperature cut-out
- pressure vessel is maintenance free

| Description                              | Article-no. |
|------------------------------------------|-------------|
| Ölman (without accessory)                | 045 8002    |
| Ölman (with oilpan and leakage detector) | 045 8004    |

## hp-Pressure-vessel aggregate in single pump execution

4.1

### hp-Single wall unit series DSK 4.1-K-ITZ

The appliances are made and tested in accordance with DIN/EN 12514-1.  
Heating oil detector LH, TÜV tested with conformity certificate for water use.

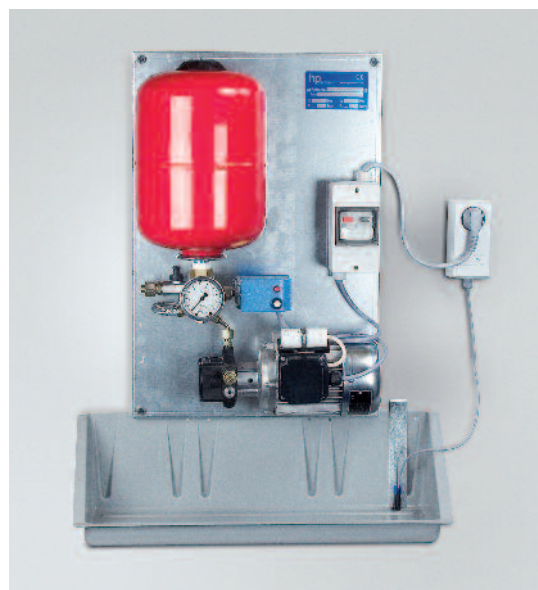
with accumulator control

with horizontal ITZ-P3 gear pump fitted on mounting plate

with overflow valve and all necessary fittings

**with safety control system:**

A dual-function oil pressure switch switches the pump off at min. pressure.



Industrial pumps,  
overflow valves

Motor pump program,  
motor pump groups

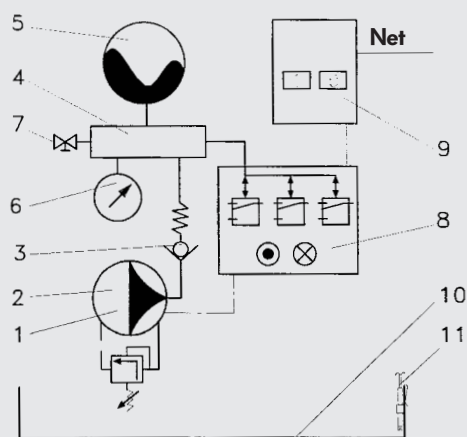
Aggregates for single-  
pipe installation

Feed pumps and  
delivery aggregates

Accessories and  
spare parts

Oil burner nozzles

Special aggregates,  
terms of sale



#### Included in delivery:

- |                                                                      |                                                                                                      |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 1 Oil filter in pump fitted                                          | 8 Pressure switch, adjustable, with start up button, Switch settings: bottom off, middle on, top off |
| 2 Internal gear pump with flanged overflow valve with AC-Motor IP 54 | 9 Motor circuit-breaker with contactor and signal lights assembled ready for connection              |
| 3 Non-return valve                                                   | 10 Oil tray B 550, H 170, T 200                                                                      |
| 4 Oil distributor                                                    | 11 Accessories: Heating oil indicator for electrical switch off in oil tray                          |
| 5 Accumulator with membrane                                          |                                                                                                      |
| 6 Manometer                                                          |                                                                                                      |
| 7 Shut-off valve for supply pipe                                     |                                                                                                      |

| Type                  | Appliance connections pipe-Ø * |         | Flow rate l/h | Continuous discharge l/h | Motor output 2800 min <sup>-1</sup> 230V, 50 Hz | Accumulator Litres | Dimensions in mm |        |       | Article-no. | max. delivery head: 20 m <sup>1)</sup><br>max. suction underpressure 4 m |
|-----------------------|--------------------------------|---------|---------------|--------------------------|-------------------------------------------------|--------------------|------------------|--------|-------|-------------|--------------------------------------------------------------------------|
|                       | Pressure                       | Suction |               |                          |                                                 |                    | With             | Height | Depth |             |                                                                          |
| DSK 4.1-6044-K-ITZ-P3 | 12                             | 12      | 140           | 110                      | 0,18                                            | 8                  | 410              | 600    | 250   | 0450032     |                                                                          |

\* To insure proper pump functioning, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site!  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

## hp-Single pressure accumulator wall unit series DSK 4.1

4.2

### hp-Single pump wall unit with pressure accumulator control

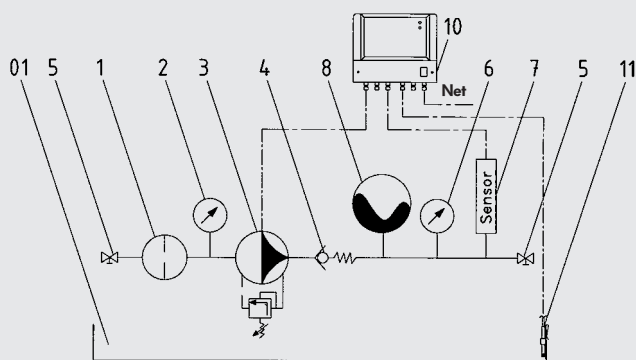
with hp internal gear pump horizontally mounted on the oil pan with overflow valve and all required fittings;

**with safety control:** a pressure transmitter switches the pump off in case of underpressure.

*Independently controls fuel oil supply unit with pressure membrane for single pumping oil supply according to DIN/EN 12514-1 of automatic oil burners.*

*Supply unit – built, tested, registered and marked according to DIN 12514-1!*

**Delivery including oil leakage detector.**



**Order text:**

hp-Single wall unit with pressure accumulator control,  
Series DSK 4.1

Capacity:.....l/h fuel oil EL

max. delivery head:.....m

Current type:.....

Voltage:.....Volt, 50 Hz

Accessories:.....

Type:.....(refer table)

**Scope of delivery of the supply unit:**

- 01 Oil pan
- 1 Oil filter
- 2 Vacuum gauge
- 3 Internal gear pump with overflow valve, flanged with direct current norm motor B3/B14, IP 54
- 4 Non-return valve
- 5 Ball valve
- 6 Pressure gauge
- 7 Pressure transmitter
- 8 Pressure accumulator with fuel oil resistant membrane and cut-off valve
- 10 hp pump controller
- 11 Oil leakage detector in oil pan for electrical shut-off

| Type         | Device connection pipe-Ø* |         | Discharge volume l/h | Capacity l/h | Motor output 1400 rmp |         | Pressure-accumulator Liter | Dimensions mm |        |       | Article-no. |         |                                                                               |
|--------------|---------------------------|---------|----------------------|--------------|-----------------------|---------|----------------------------|---------------|--------|-------|-------------|---------|-------------------------------------------------------------------------------|
|              | Pressure                  | Suction |                      |              | DC (kW)               | AC (kW) |                            | Width         | Height | Depth | DC          | AC      |                                                                               |
| DSK 4.1-1545 | 15                        | 18      | 300                  | 240          | 0,18 <sup>1)</sup>    | 0,18    | 18                         | 650           | 1000   | 320   | 0450004     | 0450015 | max. delivery head: 20 m <sup>1)</sup><br>max. suction underpressure -0,4 bar |
| DSK 4.1-1547 | 15                        | 18      | 600                  | 400          | 0,37 <sup>2)</sup>    | –       | 18                         | 650           | 1000   | 320   | 0450006     | –       |                                                                               |
| DSK 4.1-1549 | 18                        | 28      | 1500                 | 1000         | 0,75 <sup>2)</sup>    | –       | 25                         | 750           | 1000   | 420   | 0450008     | –       |                                                                               |

Pipe dimensions according to phase calculation

For assembly and commissioning as well as maintenance, observe the operating instruction enclosed with each unit!

1) Different delivery heads upon request

2) These units have a motor output of 400 V and a rotational speed of 1400 RPM

\* For faultless pump functionality, all pipes must be dimensioned according to fluidic basics via phase calculation according to the local conditions! Pump and device connection does not provide any information regarding the respective pipe dimension.

Note regarding flanged model: EO pipe screw connection for steel pipes DIN 1630 and 2391, if Cu pipes are used, the corresponding EO supporting bushing must be used!

## hp-Twin pressure accumulator wall unit series DSK 4.2 & DSK 2.16

4.3

### hp-Twin pump wall unit with pressure accumulator control

with hp internal gear pump horizontally mounted on the oil pan with overflow valve and all required fittings;

**with safety control:** a pressure transmitter switches the pump off in case of underpressure.

**Delivery including oil leakage detector.**



#### Order text:

hp-Twin wall unit with pressure accumulator control, Series DSK 4.2 for manual actuation, alternative: with pressure accumulator control Series DSK 2.16 for automatic switching and fault switching

Capacity:.....l/h fuel oil EL

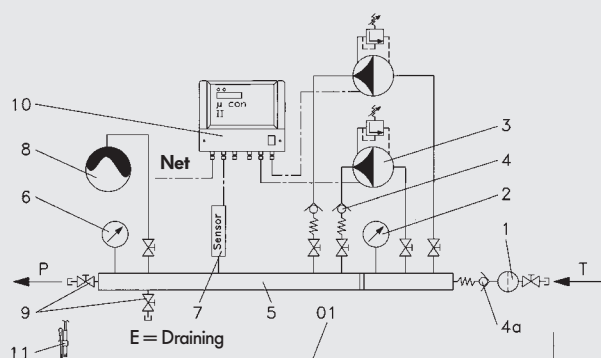
max. delivery head:.....m

Current type: .....

Voltage: .....Volt, 50 Hz

Accessories: .....

Type:.....(refer table)



#### Scope of delivery of the supply unit:

- 01 Oil pan
- 1 Oil filter with shut-off device
- 2 Vacuum gauge
- 3 Internal gear pump with overflow valve and shutoff valve at the suction side, flanged with direct current norm motor, B3/B14, IP 54
- 4 Non-return valve with shutoff valve
- 4a Non-return valve
- 5 Oil distributor
- 6 Pressure gauge
- 7 Pressure sensor
- 8 Pressure accumulator with fuel oil resistant membrane and cut-off valve
- 9 Cut-off valves for supply and vent pipes
- 10 hp-Twin pump controller
- 11 Oil leakage detector in oil pan for electrical shut-off

| Type                                           | Device connection pipe Ø * |         | Discharge volume l/h | Capacity l/h | Motor output       |                  | Pressure accumulator Liter | Dimensions mm |        |       | Article-no. |         |  |
|------------------------------------------------|----------------------------|---------|----------------------|--------------|--------------------|------------------|----------------------------|---------------|--------|-------|-------------|---------|--|
|                                                | Pressure                   | Suction |                      |              | 1400 RMP DC (kW)   | 2800 RMP AC (kW) |                            | Width         | Height | Depth | DC          | AC      |  |
| DSK 2.16-1545                                  | 15                         | 18      | 300                  | 240          | 0,18 <sup>2)</sup> | –                | 18                         | 840           | 1000   | 320   | 0460008     | 0460028 |  |
| DSK 2.16-1547                                  | 15                         | 18      | 600                  | 400          | 0,37 <sup>2)</sup> | –                | 18                         | 840           | 1000   | 320   | 0460012     | –       |  |
| DSK 2.16-1549                                  | 18                         | 28      | 1500                 | 1000         | 0,75 <sup>2)</sup> | –                | 25                         | 1050          | 1000   | 420   | 0460016     | –       |  |
| Pipe dimensions according to phase calculation |                            |         |                      |              |                    |                  |                            |               |        |       |             |         |  |

For assembly and commissioning as well as maintenance, observe the operating instruction enclosed with each unit!

1) Different delivery heads upon request.

2) These units have a motor output of 400 V and a rotational speed of 1400 RPM.

\* For faultless pump functionality, all pipes must be dimensioned according to fluidic basics via phase calculation according to the local conditions! Pump and device connection does not provide any information regarding the respective pipe dimension.

## hp-Single-pumping unit series MOG

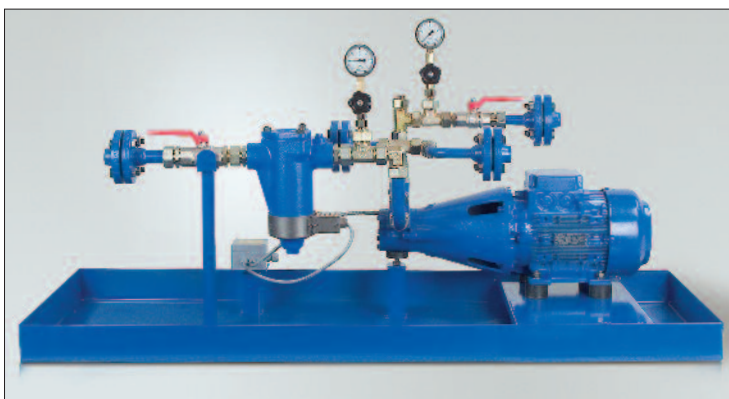
5.0

Single pumping unit for fuel oil in screwed or flanged compact execution, as a feed- or delivery aggregates for oil supply of automatic oil burners - equivalent DIN/EN 4755/2. Produced, tested, registered and marked according to the test standard DIN/EN 12514/1.

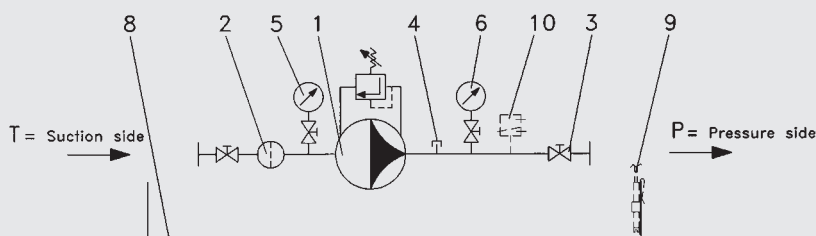
### Order text

Single pumping unit series MOG

Series MOG: ..... Refer to key  
 Discharge: ..... l/h  
 Medium: .....  
 Working pressure: ..... bar  
 Motor: ..... kW ..... V/50 Hz  
 Accessoires: ..... Series key



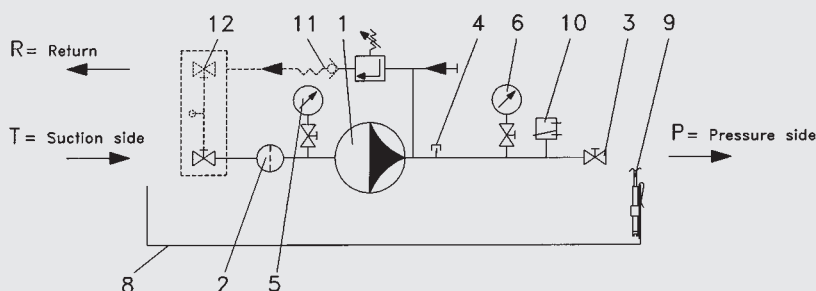
Scheme I: MOG 50, MOG 51, MOG 53 and MOG 55 (without return)



### Packing List:

1. hp-motor pump with overflow valve
2. single filter
3. ball valve
4. prefill opening
5. vacuum gauge
6. pressure gauge
8. oil pan

Scheme II: MOG 52 and MOG 54 (with return)



### Accessories:

9. oil leakage detection Type HMW LH
10. electrical pressure switch S
- pressure transmitter DT
11. nonreturn valve (only for Scheme 2, not by using Pos. 12) RV
12. double ball valve DK

### Key for determination of the order numbers:

for example: **MOG . . .**

| Series                                                                                                                                                                                                                                                                                                                                                                                                                           | Size                                          | Accessories*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>50</b> = feed pump aggregate (6 bar and 9 bar), <sup>1)</sup> fuel oil EL + L, Kerosene<br><b>51</b> = feed pump aggregate (9 bar), fuel oil M, S + ES, coaltar oil<br><b>52</b> = delivery aggregate (30 bar), fuel oil EL + L, Kerosene<br><b>53</b> = delivery aggregate 30 bar, fuel oil M, S + ES<br><b>54</b> = delivery aggregate 40 bar, fuel oil EL + L<br><b>55</b> = delivery aggregate 40 bar, fuel oil M, S + ES | Discharge see chart<br>FL = flanged execution | <b>A</b> = pump and filter with electrical stationary heating and connecting box (only for Scheme 1)<br><b>RV</b> = non-return valve (only for Scheme 2)<br><b>DK</b> = double ball valve (only for MOG 52 and MOG 54)<br><b>E1</b> = with optical filter indicator (only for flanged execution "FL")<br><b>E2</b> = with optical and electrical filter indicator (only for flanged execution "FL")<br><b>LH</b> = oil leakage detection Type HMW<br><b>S<sup>1)</sup></b> = electrical pressure switch for pipe burst monitoring and dry running protection<br><b>DT</b> = pressure transmitter |

\* Listing classification letters after each other

<sup>1)</sup> For use as feed pump aggregate for the supply with fuel oil per DIN 4736 do not exceed the working pressure of 6 bar.

Note: it is absolutely imperative that the user install an electric pressure switch (acting as a "lower limit controller"), as pipe pressure safety device, on the equipment to which the pump is to be connected. This prerequisite can be met by ordering accessory "S" and "DT".



## hp-Single-pumping unit series MOG

**5.1**

Single pumping unit for fuel oil in screwed or flanged compact execution, as a feed- or delivery aggregates for oil supply of automatic oil burners – equivalent DIN/EN 4755/2. Produced, tested, registered and marked according to the test standard DIN/EN 12514/1.



### General details:

- Operating viscosity:** The motor output data applies for fluids with a viscosity up to 80 cSt. From 80 cSt to 150 cSt, the motor must be one power stage size stronger.  
Available at a surcharge upon request.
- Max. suction head:** Measured in terms of the manometer (Pos. 5) = -0,6 bar
- Max. inlet pressure:** Pressure load of the axial face seal: -0,6 – +5 bar
- Max. nozzle loss:** 70% of discharge at  $p_{max}$ .



### Single pumping unit MOG 50 according to scheme I without bypass

| Connections*<br>Suction/pressure<br>screwed/flanged | Aggregate type<br>Refer to key<br>of made of<br>operation | Discharge<br>rating | Discharge at 1400 min <sup>-1</sup> |                        | Pump type<br>series VB | Motor output <sup>1)</sup><br>in kW | Execution according to scheme I |                        | Max. pressure<br>in bar                                                                                                   |
|-----------------------------------------------------|-----------------------------------------------------------|---------------------|-------------------------------------|------------------------|------------------------|-------------------------------------|---------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                                     |                                                           |                     | at 0 – 9 bar<br>in l/h              | at $p_{max}$<br>in l/h |                        |                                     | Screwed<br>Article-no.          | Flanged<br>Article-no. |                                                                                                                           |
| Pipe 12                                             | MOG 50                                                    | 01                  | 45                                  | –                      | VBP                    | 0,18                                | 0510101                         | –                      | designed for<br>max. working<br>pressure<br>of 9 bar<br><br>per<br>DIN/EN 12514-1<br>max. working<br>pressure<br>of 6 bar |
| Pipe 12                                             | MOG 50                                                    | 02                  | 80                                  | –                      | VBM                    | 0,18                                | 0510102                         | –                      |                                                                                                                           |
| Pipe 12                                             | MOG 50                                                    | 03                  | 120                                 | –                      | VBG                    | 0,18                                | 0510103                         | –                      |                                                                                                                           |
| Pipe 12                                             | MOG 50                                                    | 04                  | 160                                 | –                      | VBF                    | 0,18                                | 0510104                         | –                      |                                                                                                                           |
| Pipe 18/DN 15                                       | MOG 50                                                    | 05                  | 300                                 | –                      | VBGP                   | 0,18                                | 0510105                         | –                      |                                                                                                                           |
| Pipe 18/DN 15                                       | MOG 50                                                    | 06                  | 450                                 | –                      | VBGM                   | 0,37                                | 0510106                         | –                      |                                                                                                                           |
| Pipe 18/DN 15                                       | MOG 50                                                    | 07                  | 600                                 | –                      | VBGG                   | 0,37                                | 0510107                         | –                      |                                                                                                                           |
| DN 25                                               | MOG 50                                                    | 08                  | 1000                                | –                      | VBHP                   | 0,75                                | 0510108                         | –                      |                                                                                                                           |
| DN 25                                               | MOG 50                                                    | 09                  | 1500                                | –                      | VBHM                   | 0,75                                | 0510109                         | –                      |                                                                                                                           |
| DN 25                                               | MOG 50                                                    | 10                  | 2000                                | –                      | VBHG                   | 1,1                                 | 0510110                         | –                      |                                                                                                                           |
| DN 32                                               | MOG 50                                                    | 11                  | 3000                                | –                      | VBHGP                  | 1,5                                 | –                               | 0510211                |                                                                                                                           |
| DN 32                                               | MOG 50                                                    | 12                  | 4500                                | –                      | VBHGM                  | 2,2                                 | –                               | 0510212                |                                                                                                                           |
| DN 40                                               | MOG 50                                                    | 13                  | 6000                                | –                      | VBHGG                  | 3,0                                 | –                               | 0510213                |                                                                                                                           |

### Single pumping unit MOG 51 according to scheme I without bypass

|               |        |    |      |   |       |      |         |         |                                           |
|---------------|--------|----|------|---|-------|------|---------|---------|-------------------------------------------|
| Pipe 18       | MOG 51 | 01 | 45   | – | VBP   | 0,18 | 0510114 | –       | designed for<br>max. pressure<br>of 9 bar |
| Pipe 18       | MOG 51 | 02 | 80   | – | VBM   | 0,18 | 0510115 | –       |                                           |
| Pipe 18       | MOG 51 | 03 | 120  | – | VBG   | 0,18 | 0510116 | –       |                                           |
| Pipe 18       | MOG 51 | 04 | 160  | – | VBF   | 0,18 | 0510117 | –       |                                           |
| Pipe 18/DN 15 | MOG 51 | 05 | 300  | – | VBGP  | 0,18 | 0510118 | 0510218 |                                           |
| Pipe 18/DN 15 | MOG 51 | 06 | 450  | – | VBGM  | 0,37 | 0510119 | 0510219 |                                           |
| Pipe 18/DN 15 | MOG 51 | 07 | 600  | – | VBGG  | 0,37 | 0510120 | 0510220 |                                           |
| DN 25         | MOG 51 | 08 | 1000 | – | VBHP  | 0,75 | –       | 0510221 |                                           |
| DN 25         | MOG 51 | 09 | 1500 | – | VBHM  | 0,75 | –       | 0510222 |                                           |
| DN 25         | MOG 51 | 10 | 2000 | – | VBHG  | 1,1  | –       | 0510223 |                                           |
| DN 32         | MOG 51 | 11 | 3000 | – | VBHGP | 1,5  | –       | 0510224 |                                           |
| DN 32         | MOG 51 | 12 | 4500 | – | VBHGM | 2,2  | –       | 0510225 |                                           |
| DN 40         | MOG 51 | 13 | 6000 | – | VBHGG | 3,0  | –       | 0510226 |                                           |

Dimensions refer page 58/59.

\* To insure proper pump function, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site. The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.



## hp-Single-pumping unit series MOG

5.2

Single pumping unit for fuel oil in screwed or flanged compact execution, as a feed- or delivery aggregate for oil supply of automatic oil burners – equivalent DIN/EN 4755/2. Produced, tested, registered and marked according to the test standard DIN/EN 12514/1.

### General details:

- Operating viscosity:** The motor output data applies for fluids with a viscosity up to 150 cSt.
- Max. suction head:** Measured in terms of the manometer (Pos. 5) = -0,6 bar
- Max. inlet pressure:** Pressure load of the axial face seal: -0,6 to max. 5 bar (refer picture page 18)
- Max. nozzle loss:** 70% of discharge at  $p_{max}$

### Single pumping unit MOG 53 according to scheme I without bypass

| Connections** | Fuel oil-aggregate-type<br>refer to key<br>of made of<br>operation | Discharge<br>rating | Discharge at 1400 min <sup>-1</sup> |              | Pump type | Motor output <sup>1)</sup><br>kW | Article-no.                   |              | Stationary<br>heating<br>accessory „A“ | Max. pressure<br>bar                       |
|---------------|--------------------------------------------------------------------|---------------------|-------------------------------------|--------------|-----------|----------------------------------|-------------------------------|--------------|----------------------------------------|--------------------------------------------|
|               |                                                                    |                     | at 0 – 9 bar                        | at $p_{max}$ |           |                                  | According scheme I<br>Screwed | Flanged „FL“ |                                        |                                            |
| Pipe 18/DN 15 | MOG 53                                                             | 05                  | 300                                 | 240          | VBGP      | 0,75                             | 0510130                       | -            | refer<br>price list                    | designed for<br>max. pressure<br>of 30 bar |
| Pipe 18/DN 15 | MOG 53                                                             | 06                  | 450                                 | 390          | VBGM      | 1,1                              | 0510131                       | -            |                                        |                                            |
| Pipe 18/DN 15 | MOG 53                                                             | 07                  | 600                                 | 540          | VBGG      | 1,5                              | 0510132                       | -            |                                        |                                            |
|               |                                                                    |                     |                                     |              |           |                                  |                               |              |                                        |                                            |
| DN 25         | MOG 53                                                             | 08                  | 1000                                | 700          | VBHP      | 2,2                              | 0510133                       | -            |                                        |                                            |
| DN 25         | MOG 53                                                             | 09                  | 1500                                | 1200         | VBHM      | 3,0                              | 0510134                       | -            |                                        |                                            |
| DN 25         | MOG 53                                                             | 10                  | 2000                                | 1700         | VBHG      | 4,0                              | 0510135                       | -            |                                        |                                            |
|               |                                                                    |                     |                                     |              |           |                                  |                               |              |                                        |                                            |
| DN 32         | MOG 53                                                             | 11                  | 3000                                | 2200         | VBHGP     | 5,5                              | -                             | 0510236      |                                        |                                            |
| DN 32         | MOG 53                                                             | 12                  | 4500                                | 3600         | VBHGM     | 7,5                              | -                             | 0510237      |                                        |                                            |
| DN 40         | MOG 53                                                             | 13                  | 6000                                | 4800         | VBHGG     | 7,5                              | -                             | 0510238      |                                        |                                            |
|               |                                                                    |                     |                                     |              |           |                                  |                               |              | refer<br>price list                    | designed for<br>max. pressure<br>of 40 bar |
| Pipe 18/DN 15 | MOG 55                                                             | 05                  | 300                                 | 200          | VBGP      | 0,75                             | 0510140                       | 0510240      |                                        |                                            |
| Pipe 18/DN 15 | MOG 55                                                             | 06                  | 450                                 | 360          | VBGM      | 1,5                              | 0510141                       | 0510241      |                                        |                                            |
| Pipe 18/DN 15 | MOG 55                                                             | 07                  | 600                                 | 480          | VBGG      | 2,2                              | 0510142                       | 0510242      |                                        |                                            |
|               |                                                                    |                     |                                     |              |           |                                  |                               |              |                                        |                                            |
| DN 25         | MOG 55                                                             | 08                  | 1000                                | 600          | VBHP      | 3,0                              | 0510143                       | 0510243      |                                        |                                            |
| DN 25         | MOG 55                                                             | 09                  | 1500                                | 1000         | VBHM      | 4,0                              | 0510144                       | 0510244      |                                        |                                            |
| DN 25         | MOG 55                                                             | 10                  | 2000                                | 1400         | VBHG      | 5,5                              | 0510145                       | 0510245      |                                        |                                            |
|               |                                                                    |                     |                                     |              |           |                                  |                               |              |                                        |                                            |
| DN 32         | MOG 55                                                             | 11                  | 3000                                | 2000         | VBHGP     | 7,5                              | -                             | 0510246      |                                        |                                            |
| DN 32         | MOG 55                                                             | 12                  | 4500                                | 3200         | VBHGM     | 7,5                              | -                             | 0510247      |                                        |                                            |

Dimensions refer page 58/59.

### Article-no. for accessoires

A = Pump and filter with electrical stationary heating and connecting box

|                                                                                               |                                      |
|-----------------------------------------------------------------------------------------------|--------------------------------------|
| E1 = with optical filter indicator                                                            | 0820221                              |
| E2 = with optical and electrical filter indicator                                             | 0820222                              |
| LH = Oil leakage detection, (without running protection)                                      | 0720705                              |
| S = with electrical pressure switch for pipe burst monitoring<br>(without running protection) | Type FF4 0820290<br>Type DSA 0820292 |
| DT = Pressure transmitter                                                                     | Type 0720695                         |

\* To insure proper pump function, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site.  
The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

Note for the screwed version: When using a Cu pipe it is imperative that the appropriate EO supporting sleeve be used for EO threaded pipe attachments for DIN 1630 and 2391 steel pipes.

## hp-Single-pumping unit series MOG

5.3

### General details:

**Operating viscosity:** The motor output data applies for fluids with a viscosity up to 150 cSt.

**Max. suction head:** Measured in terms of the manometer

**Max. inlet pressure:** Pressure load of the axial face seal: -0,6 to max. 5 bar  
(refer picture page 18)

**Max. nozzle loss:** 70% of discharge at  $p_{max}$



### Single pumping unit MOG 52/54 according to scheme II, with bypass

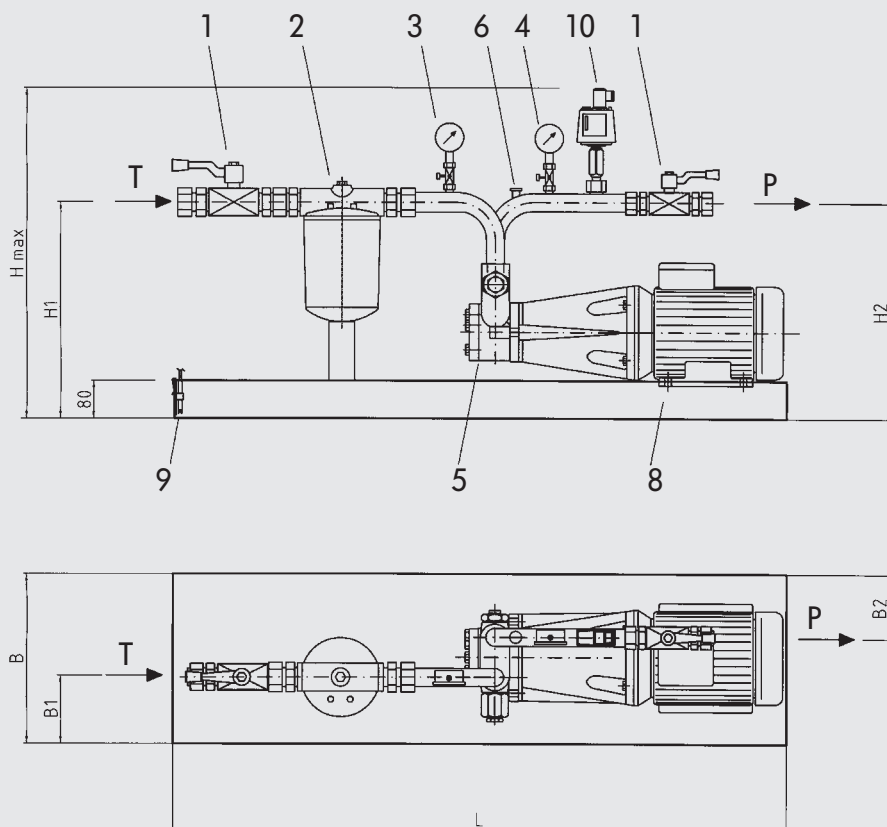
| Connections*    | Fuel oil-aggregate-type<br>refer to key<br>of made of<br>operation | Discharge -<br>rating | Discharge at 1400 min <sup>-1</sup> |                     | Pump type<br>VBR<br>at p <sub>max</sub> | Motor output <sup>1)</sup><br><br>kW | Execution according to scheme I |                        |                                                               | Max. pressure<br><br>bar                   |
|-----------------|--------------------------------------------------------------------|-----------------------|-------------------------------------|---------------------|-----------------------------------------|--------------------------------------|---------------------------------|------------------------|---------------------------------------------------------------|--------------------------------------------|
|                 |                                                                    |                       | at 0 - 9 bar                        | at p <sub>max</sub> |                                         |                                      | Screwed<br>Article-no.          | Flanged<br>Article-no. | with double ball valve<br>according scheme II<br>flanged „FL“ |                                            |
| Screwed/flanged |                                                                    |                       |                                     |                     |                                         |                                      |                                 |                        |                                                               |                                            |
| Pipe 12/DN 15   | MOG 52                                                             | 01                    | 45                                  | 30                  | VBRP                                    | 0,18                                 | 0510148                         | -                      | -                                                             | designed for<br>max. pressure<br>of 30 bar |
| Pipe 12/DN 15   | MOG 52                                                             | 02                    | 80                                  | 60                  | VBRM                                    | 0,18                                 | 0510149                         | -                      | -                                                             |                                            |
| Pipe 12/DN 15   | MOG 52                                                             | 03                    | 120                                 | 100                 | VBRG                                    | 0,18                                 | 0510150                         | -                      | -                                                             |                                            |
| Pipe 12/DN 15   | MOG 52                                                             | 04                    | 160                                 | 140                 | VBRF                                    | 0,37                                 | 0510151                         | -                      | -                                                             |                                            |
| Pipe 18/DN 15   | MOG 52                                                             | 05                    | 300                                 | 240                 | VBGRP                                   | 0,75                                 | 0510152                         | 0510252                | 0820110                                                       |                                            |
| Pipe 18/DN 15   | MOG 52                                                             | 06                    | 450                                 | 390                 | VBGRM                                   | 0,75                                 | 0510153                         | 0510253                | 0820110                                                       |                                            |
| Pipe 18/DN 15   | MOG 52                                                             | 07                    | 600                                 | 540                 | VBGRG                                   | 1,1                                  | 0510154                         | 0510254                | 0820110                                                       |                                            |
| DN 25           | MOG 52                                                             | 08                    | 1000                                | 700                 | VBHRP                                   | 1,5                                  | 0510155                         | 0510255                | 0820111                                                       |                                            |
| DN 25           | MOG 52                                                             | 09                    | 1500                                | 1200                | VBHRM                                   | 2,2                                  | 0510156                         | 0510256                | 0820112                                                       |                                            |
| DN 25           | MOG 52                                                             | 10                    | 2000                                | 1700                | VBHRG                                   | 3,0                                  | 0510157                         | 0510257                | 2820112                                                       |                                            |
| DN 32           | MOG 52                                                             | 11                    | 3000                                | 2200                | VBHGRP                                  | 4,0                                  | -                               | 0510258                | 0820113                                                       |                                            |
| DN 32           | MOG 52                                                             | 12                    | 4500                                | 3600                | VBHGRM                                  | 5,5                                  | -                               | 0510259                | 0820113                                                       |                                            |
| DN 40           | MOG 52                                                             | 13                    | 6000                                | 4800                | VBHGRG                                  | 7,5                                  | -                               | 0510260                | 0820114                                                       |                                            |
|                 |                                                                    |                       |                                     |                     |                                         |                                      |                                 |                        |                                                               | designed for<br>max. pressure<br>of 40 bar |
| Pipe 18/DN 15   | MOG 54                                                             | 05                    | 300                                 | 200                 | VBGRP                                   | 0,75                                 | 0510165                         | 0510265                | 0820110                                                       |                                            |
| Pipe 18/DN 15   | MOG 54                                                             | 06                    | 450                                 | 360                 | VBGRM                                   | 1,1                                  | 0510166                         | 0510266                | 0820110                                                       |                                            |
| Pipe 18/DN 15   | MOG 54                                                             | 07                    | 600                                 | 480                 | VBGRG                                   | 1,5                                  | 0510167                         | 0510267                | 0820110                                                       |                                            |
| DN 25           | MOG 54                                                             | 08                    | 1000                                | 600                 | VBHRP                                   | 2,2                                  | 0510168                         | 0510268                | 0820111                                                       |                                            |
| DN 25           | MOG 54                                                             | 09                    | 1500                                | 1000                | VBHRM                                   | 3,0                                  | 0510169                         | 0510269                | 0820112                                                       |                                            |
| DN 25           | MOG 54                                                             | 10                    | 2000                                | 1400                | VBHRG                                   | 4,0                                  | 0510170                         | 0510270                | 0820112                                                       |                                            |
| DN 32           | MOG 54                                                             | 11                    | 3000                                | 2200                | VBHGRP                                  | 5,5                                  | -                               | 0510271                | 0820113                                                       |                                            |
| DN 32           | MOG 54                                                             | 12                    | 4500                                | 3200                | VBHGRM                                  | 7,5                                  | -                               | 0510272                | 0820113                                                       |                                            |

Dimensions refer page 58/59.

## hp-Single-pumping unit series MOG

5.3.1

Dimensional drawing MOG according scheme I



**Packaging list:**

- 1 Overflow valve
- 2 Filter
- 3 Vakuum manometer
- 4 Manometer
- 5 hp-Motor pump group with hp-internal gear pump with internal grated overflow valve, connector and motor B3/B14, B3/B5
- 6 Pressure gauge
- 8 Oil pan

**Accessories:**

- |                                                       |         |
|-------------------------------------------------------|---------|
| 9 Oil leakage detection                               | LH      |
| 10 Electrical pressure switch or pressure transmitter | S<br>DT |

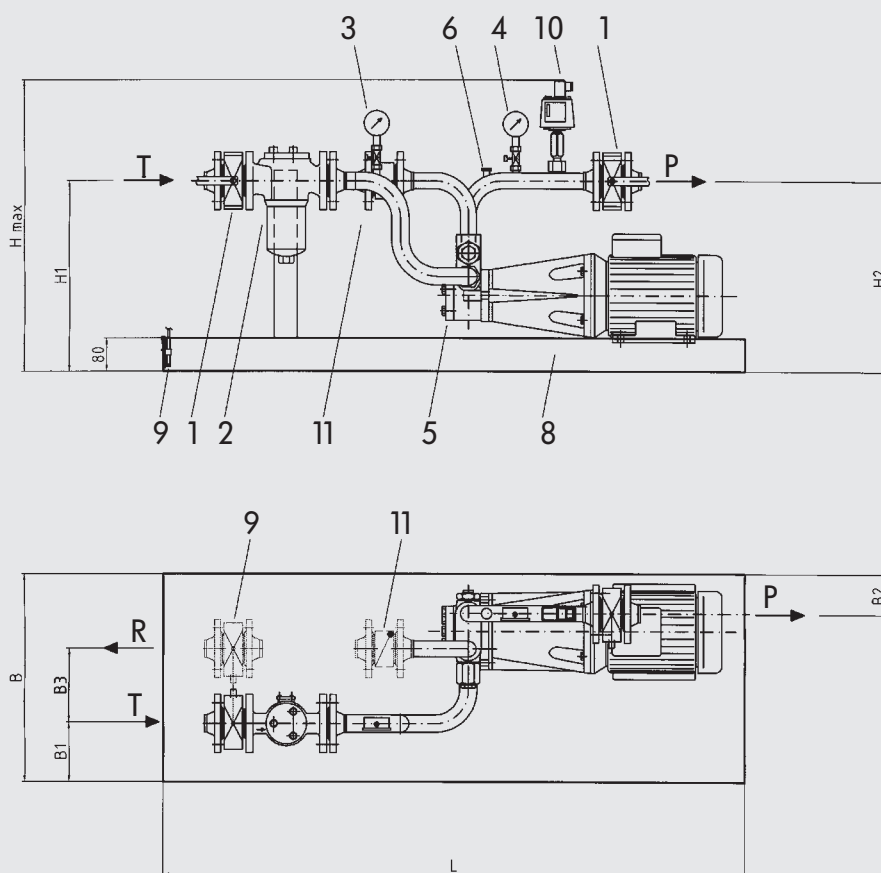
| Series | Dimensions | L<br>MOG 50 | L<br>MOG 51, 53, 55 | B   | B1 ±10 | B2 ±10 | H <sub>max.</sub> =<br>required installation<br>highest | H1 ±10 | H2 ±10 |
|--------|------------|-------------|---------------------|-----|--------|--------|---------------------------------------------------------|--------|--------|
|        | mm         | mm          | mm                  | mm  | mm     | mm     | mm                                                      | mm     | mm     |
| MOG    | 01         | 700         | 1000                | 270 | 115    | 115    | 600                                                     | 320    | 320    |
|        | 02         | 700         | 1000                | 270 | 115    | 115    | 600                                                     | 320    | 320    |
|        | 03         | 700         | 1000                | 270 | 115    | 115    | 600                                                     | 320    | 320    |
|        | 04         | 700         | 1000                | 270 | 115    | 115    | 600                                                     | 320    | 320    |
|        | 05         | 840         | 1000                | 270 | 115    | 115    | 650                                                     | 400    | 400    |
|        | 06         | 840         | 1000                | 270 | 115    | 115    | 650                                                     | 400    | 400    |
|        | 07         | 840         | 1000                | 270 | 115    | 115    | 650                                                     | 400    | 400    |
|        | 08         | 1050        | 1200                | 360 | 147    | 147    | 850                                                     | 460    | 460    |
|        | 09         | 1050        | 1200                | 360 | 147    | 147    | 850                                                     | 460    | 460    |
|        | 10         | 1050        | 1200                | 360 | 147    | 147    | 850                                                     | 460    | 460    |
|        | 11         | 1400        | 1400                | 500 | 200    | 200    | 1000                                                    | 600    | 600    |
|        | 12         | 1400        | 1400                | 500 | 200    | 200    | 1000                                                    | 600    | 600    |
|        | 13         | 1400        | 1400                | 500 | 200    | 200    | 1000                                                    | 600    | 600    |

Please note the enclosed operation, installation and maintenance instruction!

## hp-Single-pumping unit series MOG

5.3.2

Dimensional drawing MOG according scheme II



### Packaging list:

- 1 Overflow valve
- 2 Filter
- 3 Vakuum manometer
- 4 Manometer
- 5 hp-Motor pump group with hp-internal gear pump with internal grated overflow valve, connector and motor B3/B14, B3/B5
- 6 Pressure gauge
- 8 Oil pan

### Accessories:

- |                                                       |         |
|-------------------------------------------------------|---------|
| 9 Oil leakage detection                               | LH      |
| 10 Electrical pressure switch or pressure transmitter | S<br>DT |
| 11 Non return valve (not when using accessory 12)     | RV      |
| 12 Double ball valve (only MOG 52 and 54)             | DK      |

| Series | Dimensions | L    | L1  | B   | B1 <sup>±10</sup> | B2 <sup>±10</sup> | B3 <sup>±10</sup> | H <sub>max.</sub> =<br>required install-<br>ation highest | H1 <sup>±10</sup> | H2 <sup>±10</sup> |
|--------|------------|------|-----|-----|-------------------|-------------------|-------------------|-----------------------------------------------------------|-------------------|-------------------|
|        | mm         | mm   | mm  | mm  | mm                | mm                | mm                | mm                                                        | mm                | mm                |
| MOG    | 01         | 700  | 150 | 270 | 50                | 60                | 120               | 600                                                       | 180               | 350               |
|        | 02         | 700  | 150 | 270 | 50                | 60                | 120               | 600                                                       | 180               | 350               |
|        | 03         | 700  | 150 | 270 | 50                | 60                | 120               | 600                                                       | 180               | 350               |
|        | 04         | 700  | 150 | 270 | 50                | 60                | 120               | 600                                                       | 180               | 350               |
| 52     | 05         | 1050 | 350 | 360 | 80                | 100               | 140               | 650                                                       | 250               | 430               |
|        | 06         | 1050 | 350 | 360 | 80                | 100               | 140               | 650                                                       | 250               | 430               |
|        | 07         | 1050 | 350 | 360 | 80                | 100               | 140               | 650                                                       | 250               | 430               |
| 54     | 08         | 1400 | 350 | 360 | 100               | 97                | 100               | 850                                                       | 460               | 460               |
|        | 09         | 1400 | 350 | 360 | 100               | 97                | 100               | 850                                                       | 460               | 460               |
|        | 10         | 1400 | 350 | 360 | 100               | 97                | 100               | 850                                                       | 460               | 460               |
| 54     | 11         | 1600 | 500 | 500 | 150               | 150               | 100               | 1000                                                      | 500               | 600               |
|        | 12         | 1600 | 500 | 500 | 150               | 150               | 100               | 1000                                                      | 500               | 600               |
|        | 13         | 1600 | 500 | 500 | 150               | 150               | 100               | 1000                                                      | 500               | 600               |

Please note the enclosed operation, installation and maintenance instruction!

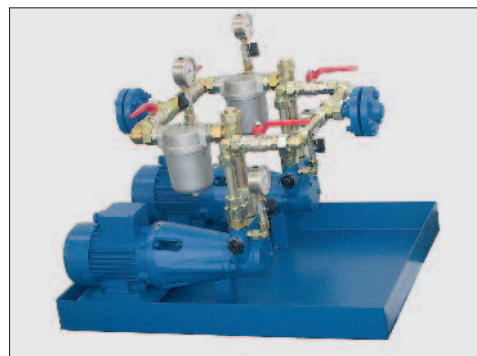
## hp-Twin-pumping unit series BIK

5.4.1

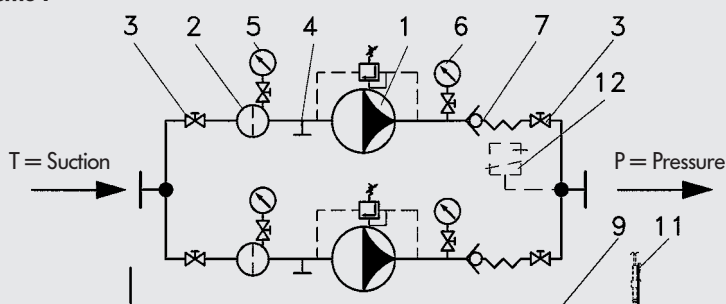
Twin pumping unit for fuel oil in screwed or flanged compact execution, as a feed- or delivery aggregate for oil supply of automatic oil burners – equivalent DIN/EN 4755/2. Produced, tested, registered and marked according to the test standard DIN/EN 12514/1.

### Order text:

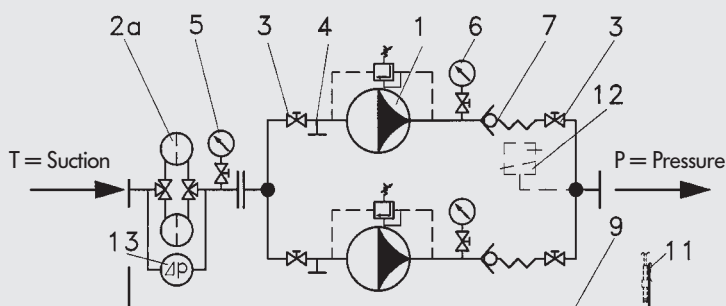
Single pumping unit series BIK  
 Series BIK: ..... refer series key .....  
 Discharge: ..... l/h ... bar  
 Medium: .....  
 Working pressure: ... bar  
 Motor: ..... kW ..... V, 50 Hz  
 Accessoires: ..... refer series key



Scheme I



Scheme II



### Packing list:

- 1 hp-Motor pump group with hp-internal gear pump with integrated overflow valve, connector and motor B3/B14, B3/B5
- 2 Single filter
- 2a Selectable double filter
- 3 Ball valve
- 4 Prefill opening
- 5 Vacuum gauge
- 6 Pressure gauge
- 7 Non-return valve
- 9 Oil pan

### Accessoires:

- 11 Oil leakage detection type HMW LH
- 12 Electrical pressure switch pressure transmitter S DT
- 13 Optical (and electrical) filter indicator E1, E2

### Series key for finding the ordering details

| BIK .....                                                                                                                                                                                                                                                                                                                                                                                                | Size                                          | Accessoires*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Series                                                                                                                                                                                                                                                                                                                                                                                                   | Size                                          | Accessoires*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>5000</b> = Feed pump aggregate <b>9 bar and 6 bar</b> , <sup>1)</sup> Fuel oil EL + L, Kerosene<br><b>51</b> = Feed pump aggregate <b>9 bar</b> , fuel oil M, S + ES, coaltar oil<br><b>52</b> = Delivery aggregate <b>30 bar</b> , Fuel oil EL + L + Kerosene<br><b>54</b> = Delivery aggregate <b>40 bar</b> , fuel oil EL + L<br><b>55</b> = Delivery aggregate <b>40 bar</b> , fuel oil M, S + ES | Discharge see chart<br>FL = flanged execution | <b>A</b> = Pump and filter with electrical stationary heating and connecting box<br><b>EF</b> = With 2 single filters<br><b>DF</b> = With switch-selectable double filter<br><b>E1</b> = With optical filter indicator<br><b>E2</b> = With optical and electrical filter indicator (E1 und E2)<br><b>LH</b> = Oil leakage detection Type HMW<br><b>S<sup>1)</sup></b> = Electrical pressure switch for pipe burst monitoring and dry running protection<br><b>DT</b> = Pressure transmitter |

\* Listening classification letters after each other

1) For use as feed pump aggregate for the supply with fuel oil per DIN/EN 12514 do not exceed the working pressure of 6 bar.

Note: it is absolutely imperative that the user install an electric pressure switch (acting as a "lower limit controller"), as pipe pressure safety device, on the equipment to which the pump is to be connected. This prerequisite can be met by ordering accessory "S" and "DT".

## hp-Twin-pumping unit series BIK

5.5

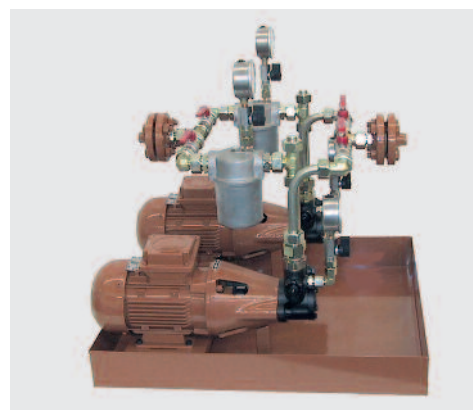
### General details:

**Operating viscosity:** The motor output data applies for fluids with a viscosity up to 80 cSt. From 80 cSt. to 150 cSt, the motor must be one power stage size stronger. Available at a surcharge upon request.

**max. suction head:** measured in terms of the manometer Pos. 3 = -0,6 bar

**max. inlet pressure:** = pressure load of the axial face seal:  
-0,6 till max. +5 bar  
(see picture page 18)

**max. nozzle loss:** = 70% of discharge at  $p_{max}$



### Twin pumping unit according to scheme I and II without bypass for heating oil EL + L

| Connections<br>suction / pressure<br>screwed / flanged | Aggregate-type | Discharge<br>at 1400 min <sup>-1</sup><br>at 0 – 9<br>in l/h | Pump Type<br>series VB | Motor-<br>output<br>in kW | Article-no. | Dimension<br>Length x breath x height | Execution with double filter<br>according to scheme II<br>Article-no. | Max. pressure<br>in bar                                                                                           |
|--------------------------------------------------------|----------------|--------------------------------------------------------------|------------------------|---------------------------|-------------|---------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Pipe D 12/without flange                               | BIK 5000-1     | 45                                                           | VBP                    | 0,18                      | 0520046     | 600 x 500 x 550                       | -                                                                     | designed for<br>max. pressure<br>of 9 bar<br><br>per DIN/EN<br>12514-1<br>max.<br>working<br>pressure<br>of 6 bar |
| Pipe D 12/without flange                               | BIK 5000-2     | 80                                                           | VBM                    | 0,18                      | 0520047     | 600 x 500 x 550                       | -                                                                     |                                                                                                                   |
| Pipe D 12/without flange                               | BIK 5000-3     | 120                                                          | VBG                    | 0,18                      | 0520048     | 600 x 500 x 550                       | -                                                                     |                                                                                                                   |
| Pipe D 12/without flange                               | BIK 5000-4     | 160                                                          | VBF                    | 0,18                      | 0520049     | 600 x 500 x 550                       | -                                                                     |                                                                                                                   |
| DN 15/DN 15                                            | BIK 5000-5     | 300                                                          | VBGP                   | 0,18                      | 0520050     | 600 x 500 x 550                       | 0520090                                                               |                                                                                                                   |
| DN 15/DN 15                                            | BIK 5000-6     | 450                                                          | VBGM                   | 0,37                      | 0520056     | 600 x 500 x 550                       | 0520091                                                               |                                                                                                                   |
| DN 15/DN 15                                            | BIK 5000-7     | 600                                                          | VBGG                   | 0,37                      | 0520057     | 600 x 500 x 550                       | 0520092                                                               |                                                                                                                   |
| DN 25/DN 25                                            | BIK 5000-8     | 1000                                                         | VBHP                   | 0,75                      | 0520058     | 800 x 700 x 700                       | 0520093                                                               |                                                                                                                   |
| DN 25/DN 25                                            | BIK 5000-9     | 1500                                                         | VBHM                   | 0,75                      | 0520059     | 800 x 700 x 700                       | 0520094                                                               |                                                                                                                   |
| DN 25/DN 25                                            | BIK 5000-10    | 2000                                                         | VBHG                   | 1,1                       | 0520060     | 800 x 700 x 700                       | 0520095                                                               |                                                                                                                   |
| DN 32/DN 32                                            | BIK 5000-11    | 3000                                                         | VBHGP                  | 1,5                       | 0520061     | 800 x 700 x 800                       | 0520096                                                               |                                                                                                                   |
| DN 32/DN 32                                            | BIK 5000-12    | 4500                                                         | VBHGM                  | 2,2                       | 0520062     | 800 x 700 x 800                       | 0520097                                                               |                                                                                                                   |
| DN 40/DN 40                                            | BIK 5000-13    | 6000                                                         | VBHGG                  | 3,0                       | 0520063     | 800 x 700 x 800                       | 0520098                                                               |                                                                                                                   |

\* To insure proper unit function, all pipe attachments must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site. The size of the pump and/or device attachments is not indicative of the pipe attachment size which must be used.

**Note for the screwed version:** When using a Cu pipe it is imperative that the appropriate EO supporting sleeve be used for EO threaded pipe attachments for DIN 1630 and 2391 steel pipes.



## hp-Twin-pumping unit series BIK

5.6

Twin pumping unit for fuel oil in screwed or flanged compact execution, as feed-or delivery aggregates for oil supply of automatic oil burners – equivalent 411 and TRD 604 (BOB) and DIN 4755 BL.2 from automatic oil burner.

**Scheme I**

**Scheme II**

**Packing list:**

- 1 Ball valve
- 2 Single filter
- 2a Selectable double filter
- 3 Vacuum-manometer
- 4 Manometer
- 5 hp-Motor pump group with hp-internal gear pump with integrated overflow valve, connector and motor B3/B14, B3/B5
- 7 Non-return valve
- 8 Oil pan

**Accessoires:**

|                               |    |
|-------------------------------|----|
| 9 Oil leakage                 | LH |
| 10 Electrical pressure switch | S  |
| pressure transmitter          | DT |

### Twin pumping unit according to scheme I and II without bypass BIK 51

| Connections*<br>screwed/flanged | Fuel oil aggregate-type                 |                     | Discharge at 1400 min <sup>-1</sup><br>and |                     | Pump<br>type VB | Motor-<br>output <sup>1)</sup><br>kW | Screwed<br>execution after<br>scheme III<br>with single<br>filter<br>Article-no. | Flanged Execution                                        |                                                                    | Stationary<br>heating<br>accessory „A“<br>only after<br>scheme I | Max.<br>pressure<br><br>bar                             |
|---------------------------------|-----------------------------------------|---------------------|--------------------------------------------|---------------------|-----------------|--------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------|
|                                 | Refer to key<br>of mode<br>of operation | Discharge<br>rating | at 0 - 9                                   | at p <sub>max</sub> |                 |                                      |                                                                                  | after scheme<br>III with<br>single filter<br>Article-no. | after scheme IV<br>with reversible<br>double filter<br>Article-no. |                                                                  |                                                         |
| Pipe 18                         | BIK 51                                  | 01                  | 45                                         | -                   | VBP             | 0,18                                 | 0520111                                                                          | -                                                        | -                                                                  | refer<br>price list                                              | designed<br>for max.<br>working<br>pressure<br>of 9 bar |
| Pipe 18                         | BIK 51                                  | 02                  | 80                                         | -                   | VBM             | 0,18                                 | 0520112                                                                          | -                                                        | -                                                                  |                                                                  |                                                         |
| Pipe 18                         | BIK 51                                  | 03                  | 120                                        | -                   | VBG             | 0,18                                 | 0520113                                                                          | -                                                        | -                                                                  |                                                                  |                                                         |
| Pipe 18                         | BIK 51                                  | 04                  | 160                                        | -                   | VBF             | 0,18                                 | 0520114                                                                          | -                                                        | -                                                                  |                                                                  |                                                         |
| Pipe 18/DN 20                   | BIK 51                                  | 05                  | 300                                        | -                   | VBGP            | 0,18                                 | 0520115                                                                          | 0520330                                                  | 0520340                                                            |                                                                  |                                                         |
| Pipe 18/DN 20                   | BIK 51                                  | 06                  | 450                                        | -                   | VBGM            | 0,37                                 | 0520116                                                                          | 0520331                                                  | 0520341                                                            |                                                                  |                                                         |
| DN 20/DN 20                     | BIK 51                                  | 07                  | 600                                        | -                   | VBGG            | 0,37                                 | 0520117                                                                          | 0520332                                                  | 0520342                                                            |                                                                  |                                                         |
| DN 25                           | BIK 51                                  | 08                  | 1000                                       | -                   | VBHP            | 0,75                                 | 0520118                                                                          | 0520333                                                  | 0520343                                                            |                                                                  |                                                         |
| DN 25                           | BIK 51                                  | 09                  | 1500                                       | -                   | VBHM            | 0,75                                 | -                                                                                | 0520334                                                  | 0520344                                                            |                                                                  |                                                         |
| DN 32                           | BIK 51                                  | 10                  | 2000                                       | -                   | VBHG            | 1,1                                  | -                                                                                | 0520335                                                  | 0520345                                                            |                                                                  |                                                         |
| DN 32                           | BIK 51                                  | 11                  | 3000                                       | -                   | VBHGP           | 1,5                                  | -                                                                                | 0520336                                                  | 0520346                                                            |                                                                  |                                                         |
| DN 40                           | BIK 51                                  | 12                  | 4500                                       | -                   | VBHGM           | 2,2                                  | -                                                                                | 0520337                                                  | 0520347                                                            |                                                                  |                                                         |
| DN 50                           | BIK 51                                  | 13                  | 6000                                       | -                   | VBHGG           | 3,0                                  | -                                                                                | 0520338                                                  | 0520348                                                            |                                                                  |                                                         |

### Twin pumping unit according to scheme I and II without bypass BIK 55

|               |        |    |      |      |       |      |         |         |         |                     |                                                          |
|---------------|--------|----|------|------|-------|------|---------|---------|---------|---------------------|----------------------------------------------------------|
| Pipe 18/DN 20 | BIK 55 | 05 | 300  | 200  | VBGP  | 0,75 | 0520133 | 0520370 | -       | refer<br>price list | designed<br>for max.<br>working<br>pressure<br>of 40 bar |
| Pipe 18/DN 20 | BIK 55 | 06 | 450  | 360  | VBGM  | 1,5  | 0520134 | 0520371 | -       |                     |                                                          |
| DN 25         | BIK 55 | 07 | 600  | 480  | VBGG  | 2,2  | 0520135 | 0520372 | -       |                     |                                                          |
| DN 25         | BIK 55 | 08 | 1000 | 600  | VBHP  | 3,0  | 0520136 | 0520373 | 0520380 |                     |                                                          |
| DN 25         | BIK 55 | 09 | 1500 | 1000 | VBHM  | 4,0  | -       | 0520374 | 0520381 |                     |                                                          |
| DN 32         | BIK 55 | 10 | 2000 | 1400 | VBHG  | 5,5  | -       | 0520375 | 0520382 |                     |                                                          |
| DN 32         | BIK 55 | 11 | 3000 | 2000 | VBHGP | 7,5  | -       | 0520376 | 0520383 |                     |                                                          |
| DN 40         | BIK 55 | 12 | 4500 | 3200 | VBHGM | 7,5  | -       | 0520377 | 0520384 |                     |                                                          |

Dimensions refer page 60/61.

\* To insure proper pump function, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site. The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

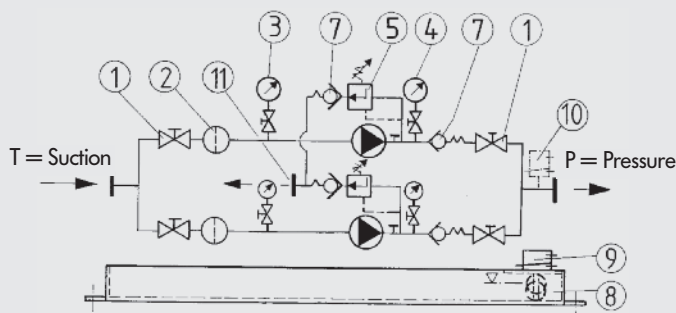
Note for the screwed version: When using a Cu pipe it is imperative that the appropriate EO supporting sleeve be used for EO threaded pipe attachments for DIN 1630 and 2391 steel pipes.

## hp-Twin-pumping unit series BIK

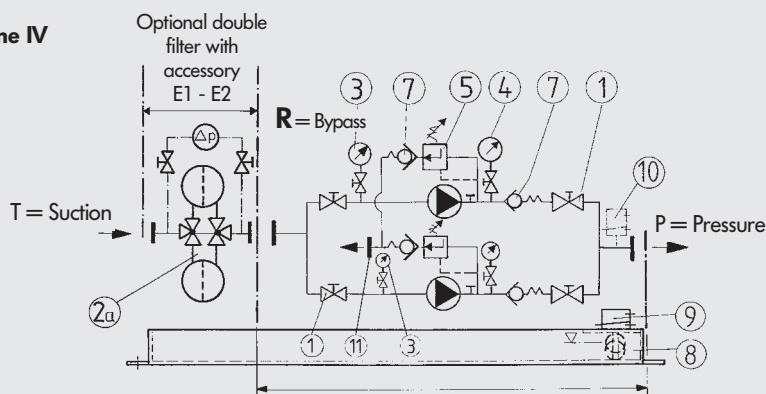
5.7

Twin pumping unit for fuel oil in screwed or flanged compact execution, as feed-or delivery aggregates for oil supply of automatic oil burners – equivalent 411 and TRD 604 (BOB) and DIN 4755 BL.2 from automatic oil burner.

Scheme III



Scheme IV



### Packaging list:

- 1 Ball valve
- 2 Single filter
- 2a Selectable double filter
- 3 Vacuum manometer
- 4 Manometer
- 5 hp-Motor pump group with hp-internal gear pump with integrated overflow valve, connector and motor B3/B14, B3/B5
- 7 Non-return valve
- 8 Oil pan

### Accessoires:

- 9 Leakage oil LH
- 10 Electrical pressure switch, pressure transmitter S DT
- 11 with bypass- for BIK 52, BIK 54 R

## Twin pumping unit BIK 52 according to scheme III and IV with bypass

| Connections*<br>screwed/flanged                 |                             | Fuel oil aggregate-type                 |                     | Discharge at 1400 min <sup>-1</sup> |                               | Pump type<br>series<br>VBR | Motor-<br>output <sup>1)</sup><br>single filter<br>in kW | Screwed<br>execution after<br>scheme III<br>with single<br>filter<br>Article-no. |         | Flanged execution<br>after scheme<br>III with<br>single filter<br>Article-no. |  | Max.<br>pressure<br>in bar                               |
|-------------------------------------------------|-----------------------------|-----------------------------------------|---------------------|-------------------------------------|-------------------------------|----------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------|--|----------------------------------------------------------|
| T = Suction/PN 16<br>P = Pressure/PN 40<br>(mm) | R = Return<br>PN 16<br>(mm) | Refer to key<br>of mode of<br>operation | Discharge<br>rating | at 0 - 9 bar<br>in l/h              | at p <sub>max</sub><br>in l/h |                            |                                                          |                                                                                  |         | after scheme IV<br>with reversible<br>double filter<br>Article-no.            |  |                                                          |
| Pipe 12                                         | Pipe 12                     | BIK 52                                  | 01                  | 45                                  | 30                            | VBRP                       | 0,18                                                     | 0520141                                                                          | -       | -                                                                             |  | designed<br>for max.<br>working<br>pressure<br>of 30 bar |
| Pipe 12                                         | Pipe 12                     | BIK 52                                  | 02                  | 80                                  | 60                            | VBRM                       | 0,18                                                     | 0520142                                                                          | -       | -                                                                             |  |                                                          |
| Pipe 12                                         | Pipe 12                     | BIK 52                                  | 03                  | 120                                 | 100                           | VBRG                       | 0,18                                                     | 0520143                                                                          | -       | -                                                                             |  |                                                          |
| Rohr 12                                         | Pipe 12                     | BIK 52                                  | 04                  | 160                                 | 140                           | VBRF                       | 0,37                                                     | 0520144                                                                          | -       | -                                                                             |  |                                                          |
| Pipe 18/DN 20                                   | Pipe 18/DN 15               | BIK 52                                  | 05                  | 300                                 | 240                           | VBGRP                      | 0,75                                                     | 0520145                                                                          | 0520390 | 0520400                                                                       |  |                                                          |
| Pipe 18/DN 20                                   | Pipe 18/DN 15               | BIK 52                                  | 06                  | 450                                 | 390                           | VBGRM                      | 0,75                                                     | 0520146                                                                          | 0520391 | 0520401                                                                       |  |                                                          |
| Pipe 18/DN 20                                   | Pipe 18/DN 15               | BIK 52                                  | 07                  | 600                                 | 540                           | VBGRG                      | 1,1                                                      | 0520147                                                                          | 0520392 | 0520402                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 52                                  | 08                  | 1000                                | 700                           | VBHRP                      | 1,5                                                      | -                                                                                | 0520393 | 0520403                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 52                                  | 09                  | 1500                                | 1200                          | VBHRM                      | 2,2                                                      | -                                                                                | 0520394 | 0520404                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 52                                  | 10                  | 2000                                | 1700                          | VBHRG                      | 3,0                                                      | -                                                                                | 0520395 | 0520405                                                                       |  |                                                          |
| DN 32                                           | DN 25                       | BIK 52                                  | 11                  | 3000                                | 2200                          | VBHGRP                     | 4,0                                                      | -                                                                                | 0520396 | 0520406                                                                       |  |                                                          |
| DN 32                                           | DN 25                       | BIK 52                                  | 12                  | 4500                                | 3600                          | VBHGRM                     | 5,5                                                      | -                                                                                | 0520397 | 0520407                                                                       |  |                                                          |
| DN 40                                           | DN 32                       | BIK 52                                  | 13                  | 6000                                | 4800                          | VBHGRG                     | 7,5                                                      | -                                                                                | 0520398 | 0520408                                                                       |  |                                                          |
| Pipe 18/DN 20                                   | Pipe 18/DN 20               | BIK 54                                  | 05                  | 300                                 | 200                           | VBGRP                      | 0,75                                                     | 0520154                                                                          | 0520410 | 0520420                                                                       |  | designed<br>for max.<br>working<br>pressure<br>of 40 bar |
| Pipe 18/DN 20                                   | Pipe 18/DN 20               | BIK 54                                  | 06                  | 450                                 | 360                           | VBGRM                      | 1,1                                                      | 0520155                                                                          | 0520411 | 0520421                                                                       |  |                                                          |
| Pipe 18/DN 20                                   | Pipe 18/DN 20               | BIK 54                                  | 07                  | 600                                 | 480                           | VBGRG                      | 1,5                                                      | 0520156                                                                          | 0520412 | 0520422                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 54                                  | 08                  | 1000                                | 600                           | VBHRP                      | 2,2                                                      | -                                                                                | 0520413 | 0520423                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 54                                  | 09                  | 1500                                | 1000                          | VBHRM                      | 3,0                                                      | -                                                                                | 0520414 | 0520424                                                                       |  |                                                          |
| DN 25                                           | DN 20                       | BIK 54                                  | 10                  | 2000                                | 1400                          | VBHRG                      | 4,0                                                      | -                                                                                | 0520415 | 0520425                                                                       |  |                                                          |
| DN 32                                           | DN 25                       | BIK 54                                  | 11                  | 3000                                | 2000                          | VBHGRP                     | 5,5                                                      | -                                                                                | 0520416 | 0520426                                                                       |  |                                                          |
| DN 32                                           | DN 25                       | BIK 54                                  | 12                  | 4500                                | 3200                          | VBHGRM                     | 7,5                                                      | -                                                                                | 0520417 | 0520427                                                                       |  |                                                          |

Dimensions refer page 60/61.

\* To insure proper pump function, all pipe connections must be sized as per the principles of fluid technology using the phase quantity and in accordance with the given conditions at the installation site. The size of the pump and/or device connections is not indicative of the size of the pipe connection which must be used.

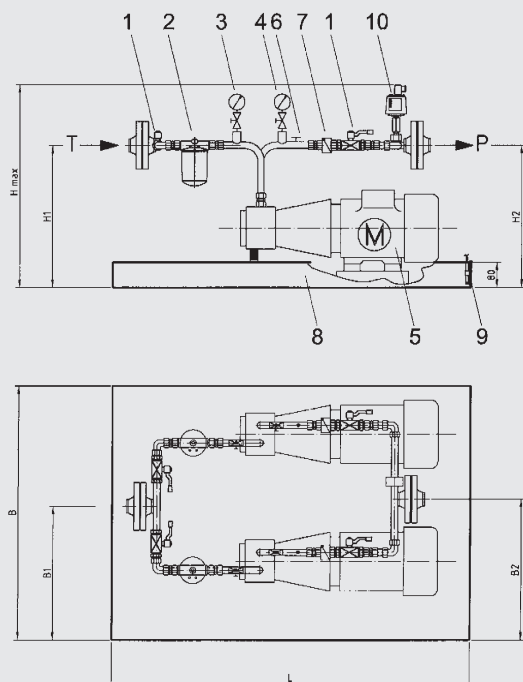
Note for the screwed version: When using a Cu pipe it is imperative that the appropriate EO supporting sleeve be used for EO threaded pipe attachments for DIN 1630 and 2391 steel pipes.

## hp-Twin-pumping unit series BIK

5.7.1

### Dimensional drawing MOG according scheme I and II

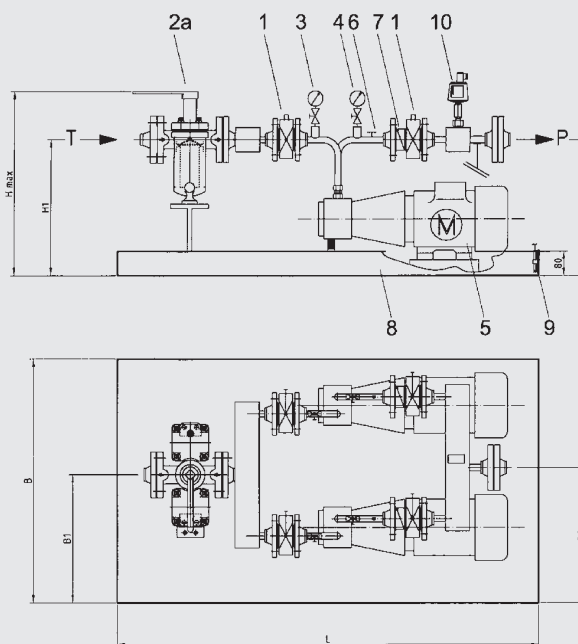
**Scheme I**



**Packing list:**

- 1 Ball valve
- 2 Single filter
- 2a Selectable double filter
- 3 Vacuum manometer
- 4 Manometer
- 5 hp-Motor pump group with  
hp-internal gear pump with integrated overflow valve,  
connector and motor B3/B14, B3/B5
- 7 Non-return valve
- 8 Oil pan

**Scheme II**



**Accessoires:**

- 9 Oil leakage LH
- 10 Electrical pressure switch,  
pressure transmitter S  
DT

| Series | Size | Dimension in mm |                     |     |             |             |             |      | $H_{max}$ =<br>required install-<br>ation highest | $H1 \pm 10$ | $H2 \pm 10$ | $H3 \pm 10$ |
|--------|------|-----------------|---------------------|-----|-------------|-------------|-------------|------|---------------------------------------------------|-------------|-------------|-------------|
|        |      | L<br>BIK 50     | L<br>BIK 51, 53, 55 | B   | $B1 \pm 10$ | $B2 \pm 10$ | $B3 \pm 10$ |      |                                                   |             |             |             |
| BIK    | 01   | 1000            | 1000                | 500 | 250         | 250         | -           | 600  | 320                                               | 320         | -           | -           |
|        | 02   | 1000            | 1000                | 500 | 250         | 250         | -           | 600  | 320                                               | 320         | -           | -           |
|        | 03   | 1000            | 1000                | 500 | 250         | 250         | -           | 600  | 320                                               | 320         | -           | -           |
|        | 04   | 1000            | 1000                | 500 | 250         | 250         | -           | 600  | 320                                               | 320         | -           | -           |
|        | 05   | 1000            | 1000                | 500 | 250         | 250         | -           | 650  | 400                                               | 400         | -           | -           |
| 51     | 06   | 1000            | 1000                | 500 | 250         | 250         | -           | 650  | 400                                               | 400         | -           | -           |
|        | 07   | 1000            | 1000                | 500 | 250         | 250         | -           | 650  | 400                                               | 400         | -           | -           |
|        | 08   | 1400            | 1400                | 650 | 325         | 325         | -           | 850  | 460                                               | 460         | -           | -           |
|        | 09   | 1400            | 1400                | 650 | 325         | 325         | -           | 850  | 460                                               | 460         | -           | -           |
| 55     | 10   | 1400            | 1400                | 650 | 325         | 325         | -           | 850  | 460                                               | 460         | -           | -           |
|        | 11   | 1800            | 1800                | 800 | 400         | 400         | -           | 1100 | 600                                               | 600         | -           | -           |
|        | 12   | 1800            | 1800                | 800 | 400         | 400         | -           | 1100 | 600                                               | 600         | -           | -           |
|        | 13   | 1800            | 1800                | 800 | 400         | 400         | -           | 1100 | 600                                               | 600         | -           | -           |

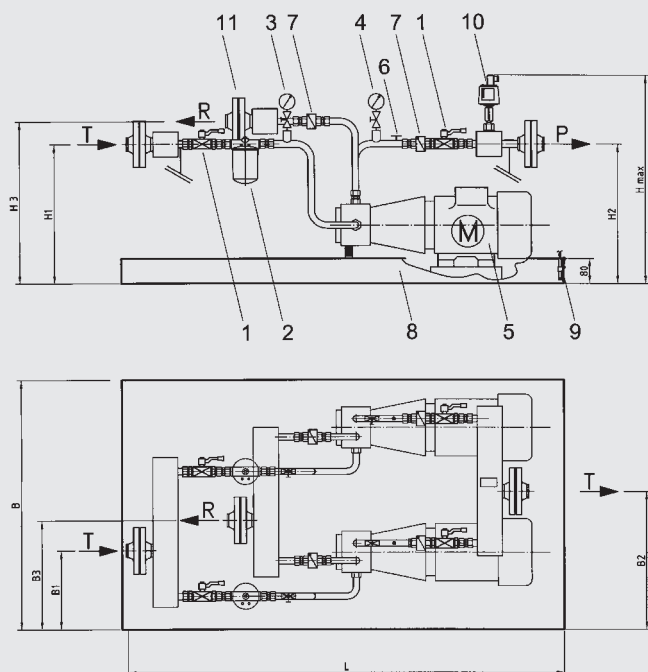
Please note the enclosed operation, installation and maintenance instruction!

## hp-Twin-pumping unit series BIK

5.7.2

Dimensional drawing MOG according scheme III and IV

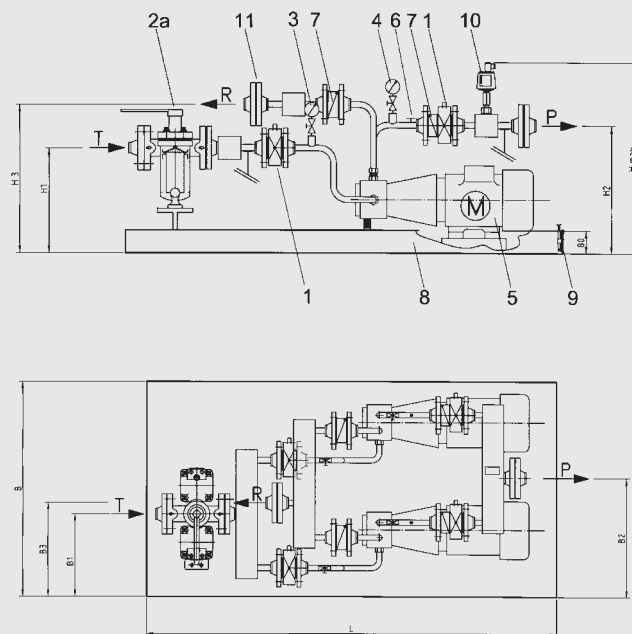
**Scheme III**



**Packing list:**

- 1 Ball valve
- 2 Single filter
- 2a Selectable double filter
- 3 Vacuum manometer
- 4 Manometer
- 5 hp-Motor pump group with hp-internal gear pump with integrated overflow valve, connector and motor B3/B14, B3/B5
- 7 Non-return valve
- 8 Oil pan

**Scheme IV**



**Accessoires:**

- 9 Oil leakage LH
- 10 Electrical pressure switch, pressure transmitter S  
DT
- 11 with bypass for BIK 52, BIK 54 R

| Series          | Size | Dimension in mm |     |     |             |             |             |                                                          |             |             |             |
|-----------------|------|-----------------|-----|-----|-------------|-------------|-------------|----------------------------------------------------------|-------------|-------------|-------------|
|                 |      | L               | L1  | B   | B1 $\pm 10$ | B2 $\pm 10$ | B3 $\pm 10$ | H <sub>max</sub> =<br>required install-<br>ation highest | H1 $\pm 10$ | H2 $\pm 10$ | H3 $\pm 10$ |
| BIK<br>52<br>54 | 01   | 1000            | 200 | 500 | 280         | 210         | 120         | 600                                                      | 180         | 350         | 350         |
|                 | 02   | 1000            | 200 | 500 | 280         | 210         | 120         | 600                                                      | 180         | 350         | 350         |
|                 | 03   | 1000            | 200 | 500 | 280         | 210         | 120         | 600                                                      | 180         | 350         | 350         |
|                 | 04   | 1000            | 200 | 500 | 280         | 210         | 120         | 600                                                      | 180         | 350         | 350         |
|                 | 05   | 1000            | 250 | 650 | 380         | 380         | 130         | 650                                                      | 250         | 430         | 430         |
|                 | 06   | 1000            | 250 | 650 | 380         | 380         | 130         | 650                                                      | 250         | 430         | 430         |
|                 | 07   | 1000            | 250 | 650 | 380         | 380         | 130         | 650                                                      | 250         | 430         | 430         |
|                 | 08   | 1400            | 700 | 650 | 285         | 365         | 200         | 850                                                      | 460         | 460         | 560         |
|                 | 09   | 1400            | 700 | 650 | 285         | 365         | 200         | 850                                                      | 460         | 460         | 560         |
|                 | 10   | 1400            | 700 | 650 | 285         | 365         | 200         | 850                                                      | 460         | 460         | 560         |
|                 | 11   | 1800            | 950 | 800 | 350         | 450         | 250         | 1100                                                     | 500         | 600         | 650         |
|                 | 12   | 1800            | 950 | 800 | 350         | 450         | 250         | 1100                                                     | 500         | 600         | 650         |
|                 | 13   | 1800            | 950 | 800 | 350         | 450         | 250         | 1100                                                     | 500         | 600         | 650         |

Please note the enclosed operation, installation and maintenance instruction!

## Accessories and spare parts

6.0



### hp-Programmable pump controller series $\mu$ Con II

The  $\mu$  Con II controller is suitable for deployment with single and double pump systems in continuous or intermittent operation (pressure control only). The number of pumps, the level or pressure switching points and the filling time of the plant are stored. In the program code as standard values, but can be altered and permanently saved within the configuration menu to suit specific customers' requirements.

In the standard version, a connected load of up to  $P_M = 1,5$  kW is possible. Additionally, for loads of  $P > 1,5$  kW, a power base-unit is provided which is clamped to the pump controller and constitutes the base unit of the modular system. Thus a power transmission up to  $P \leq 4,0$  kW is possible.

Article-no.  
0710050



### Fuel oil leakage detector HMS

For monitoring leakages. Consisting of a plug-and-socket case with control unit and optical sensor with angel mount for installation in an oil leakage sump.

Article-no.  
0720701

connection: 230 V, IP 20  
display: operation mode-green; alarm indication signal-red  
cable length: 2 m



### Fuel oil leakage detector HMW

For monitoring leakages. Consisting of switch box with control unit and optical sensor with angel mount for installation in an oil leakage sump.

connection: 230 V, IP 20  
display: operation mode-green; alarm indication signal-red

Detector with floating output.

| Cable length | Article-no. |
|--------------|-------------|
|              | 0720705     |
| 2 m          | 0720721     |
| 10 m         | 0720722     |
| 30 m         | 0720724     |



### Pressure maintaining valves (components not tested)

Fixed at 3 bar. After removing of the lead seal, pressure is adjustable.

| Connection | Article-no. |
|------------|-------------|
| G3/8"      | 0820370     |



### Safety valves

approved as per TÜV

Fixed at 3 bar. Not adjustable.

| Connection   | Article-no. |
|--------------|-------------|
| G1/2" and 1" | 0820372     |



### Pressure controller/pressure limiter DSB

approved as per TÜV

230 V, 50 Hz, IP 64 as per DIN 3398 Part 4  
Temperature range 0 - 70 °C

| Series  | Pressure stage | Article-no. |
|---------|----------------|-------------|
| DSB 140 | 0,2 - 2,5 bar  | 0720670     |
| DSB 143 | 0,5 - 6 bar    | 0720672     |
| DSB 146 | 1 - 10 bar     | 0720674     |
| DSB 152 | 6 - 16 bar     | 0720675     |
| DSB 170 | 15 - 40 bar    | 0720676     |



### Solenoid valve, series D 21

current-freely closed, direct controlled

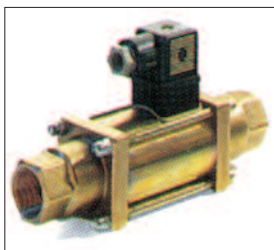
230 V, 50 Hz for fuel oil EL  
 $P_{max}$ : 0 - 10 bar

| Connection | DN | Throughput (l/h) | Article-no. |
|------------|----|------------------|-------------|
| G3/8"      | 15 | 160              | 0820241     |
| G1/2"      | 15 | 600              | 0820242     |
| G3/4"      | 15 | 2000             | 0820243     |
| G1"        | 25 | 6000             | 0820244     |

For Lucifer valves please send specified enquiry.

## Accessories and spare parts

6.1



### Solenoid valve (DIN and TÜV checked)

Current-freely closed  
suitable for sucking site  
for fuel oil EL  
 $p_{max}$ : 0 - 40 bar

|                                     | Connection | DN | Throughput (l/h) | Article-no. |
|-------------------------------------|------------|----|------------------|-------------|
| Plug with rectifier                 | G 3/8"     | 10 | 200              | 0820256     |
| Plug with rectifier                 | G 1/2"     | 10 | 600              | 0820257     |
| with a separate rectifier           | G 3/4"     | 15 | 1000             | 0820258     |
| with a separate rectifier           | G 1"       | 15 | 2000             | 0820259     |
| with a sep. rectifier (without TÜV) | G 1 1/4"   | 20 | 4500             | 0820260     |



### Regulator for fuel oil EL

pressure after regulator: adjustable 0,1 - 1 bar with manometer  
adjustable 0,2 - 2,5 bar with manometer

Admission pressure: max. 10 bar

| Connection | Throughput (l/h) | Article-no. |
|------------|------------------|-------------|
| G 1/4"     | 180              | 0820185     |
| G 3/8"     | 480              | 0820186     |
| G 1/2"     | 1200             | 0820187     |
| G 3/4"     | 1800             | 0820188     |
| G 1"       | 2400             | 0820189     |



### EG 1 series

The single filter with screw-on connection

Connection:

G 1/2" up to 2"

Material:

GGG 40, G-CuSn10/12

Working overpressure:

up to 16 bar

Filter element:

filter basket

Filter fineness:

100 and 540  $\mu$ m, other finenesses upon request

Options:

- heating (steam/thermal oil, electrical)
- magnetic elements
- separate differential pressure indicator/switch



### EG 2 series

The single filter with flange connection

Connection:

DN 20 to DN 150

Material:

GGG 40, stainless steel casting 1.4581

Working overpressure:

up to 16 bar

Filter element:

filter basket, filter cartridge

Filter fineness:

100 and 540  $\mu$ m, other finenesses upon request

Options:

- heating (steam/thermal oil, electrical)
- magnetic elements
- differential pressure indicator/switch mounted on the filter
- internally coated or rubberised



### UG 54 series

The standard filter with cock change-over facility

Connection:

DN 20 to DN 80

Material:

GGG 40, G-CuSn 10/12

Working overpressure:

up to 10 bar

Filter element:

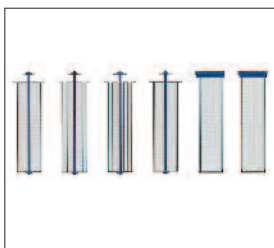
filter basket

Filter fineness:

100 and 540  $\mu$ m, other finenesses upon request

Options:

- heating (steam/thermal oil, electrical)
- magnetic elements
- differential pressure indicator/switch mounted on the filter



### Filter elements

A number of filter elements are available for all AKO, Boll & Kirch, Anello and Oventrop filters. Material, shape, filtration area and fineness are optimised to suit the medium. Performance is optimised to suit the filtration task requirements.



## Accessories and spare parts for hp-Units

6.2

### Oil meter HZ 3 for central oil supply – oil heaters - oil meter for perfect consumption control



Installation also in oil central heating systems with single pipe system (suction capacity) possible, max -0.3 bar

#### Technical data:

Measuring accuracy  $\pm 1\%$   
Calibrated flow range 0.17 to 12 l/h  
Max flow range 30 l/h = 25 kg/h  
Heater output 1.65 kW to 275 kW  
Connection thread DIN 3852-X-G 1/4" inner

The oil meter HZ 3 can be used as measuring device for fuel oil EL and diesel. Smallest amounts can be measured with highest accuracy. Just read out your oil consumption. The calibrated oil meter (10 years calibration validity) enables accurate consumer billing and is robust and long-lasting.

|           |                |                     |
|-----------|----------------|---------------------|
| Type HZ 3 | Factory-tested | Article-no. 0700350 |
| Type HZ 3 | calibrated     | Article-no. 0700351 |

### Oil meter HZ 5 RR with integrated reed contact as "impulse transmitter and mechanical counter"

### Oil meter HZ 5 for central oil heating systems, installation in pressure and suction pipes possible



#### Accurate consumer control

- High data security
- Consumption can be electronically processed
- Data can be statistically analyzed
- Consumption economy calculations possible
- Robust and long-lasting
- Energy-efficient and cost-saving
- Retrofit in each existing heating system
- Accurate consumption and storage control
- Alarm system for possible heating malfunctions
- Optimal use of oil cost deviations

#### Technical data:

Measuring accuracy:  $\pm 1\%$   
Fuel oil types: EL according to DIN 516003  
Flow range: 0,7 bis 40 l/h  
Temperature range:  $-5\text{ }^{\circ}\text{C} - +70\text{ }^{\circ}\text{C}$   
Impulse value: 1 Impuls = 0,02 l  
Connection thread: DIN 3852-X-G1/8" inner  
Nominal pressure: 25 bar  
Dimensions: 60 x 60 x 85 mm  
Pressure loss: 0.1 to 0.2 bar  
Weight: 0.6 kg

|             |                          |                     |
|-------------|--------------------------|---------------------|
| Type HZ 5   |                          | Article-no. 0700352 |
| Type HZ 5 R | with impulse transmitter | Article-no. 0700353 |

### Piston oil flow meter

Oil and fuel meter with integrated backlash-free piston.  
Measuring accuracy independent from medium viscosity and density  
 $\pm 1.0\%$  of actual value at 1...2 mPa/s



| Oil meter type  | VZO 4     | VZO 8     | VZO 15 RC | VZO 20 RC | VZO 25 RC | VZO 40 RC |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Thread in inch  | 1/8"      | 1/4"      | 1/2"      | 3/4"      | 1"        | 2"        |
| Article-no.     | 070 0300  | 070 0308  | 070 0312  | 070 0320  | 070 0326  | 070 0332  |
| Connection pair | 070 0308m | 070 0308m | 070 0312V | 070 0320V | 070 0327V | 070 0332V |

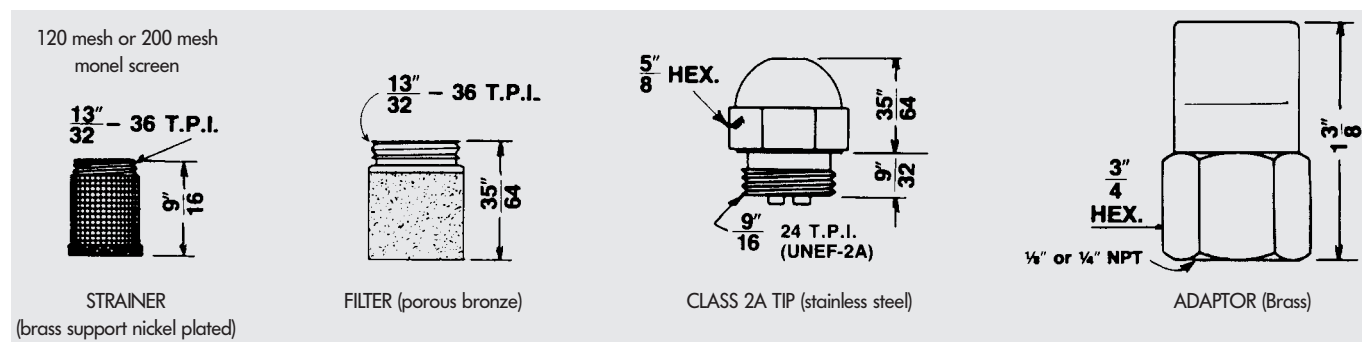
| Flange model                      |     |     | VZO 15 FL | VZO 20 FL | VZO 25 FL | VZO 40 FL |
|-----------------------------------|-----|-----|-----------|-----------|-----------|-----------|
| Nominal diameter                  | 4   | 8   | 15        | 20        | 25        | 40        |
| Article-no.                       | -   | -   | 070 0316  | 070 0323  | 070 0329  | 070 0336  |
| Max flow rate in l/h              | 80  | 200 | 600       | 1500      | 3000      | 9000      |
| Continuous flow rate in l/h       | 50  | 135 | 400       | 1000      | 2000      | 6000      |
| Min flow rate in l/h              | 1   | 4   | 10        | 30        | 75        | 225       |
| Start at approx. l/h              | 0,5 | 1,6 | 4         | 12        | 30        | 90        |
| Nominal pressure in bar           | 25  | 25  | 16        | 16        | 16        | 16        |
| Temperature in $^{\circ}\text{C}$ | 60  | 60  | 130       | 130       | 130       | 130       |
| Special designs upon request      | -   | -   | 25/40     | 25/40     | 25/40     | 25/40     |

| Model with teletransmitter       |                                    |                                         |                                        |                                    |                                    |                                            |
|----------------------------------|------------------------------------|-----------------------------------------|----------------------------------------|------------------------------------|------------------------------------|--------------------------------------------|
| Reed impulse transmitter RV      | RE 0,00125 - 0,1<br>070 032 - 0305 | RE 0,00311 / 0,1 / 1<br>070 0309 - 0311 | RV 0,1 / 070 0313<br>RV 0,1 / 070 0317 | RV 1 / 070 0321<br>RV 1 / 070 0324 | RV 1 / 070 0327<br>RV 1 / 070 0330 | RV 1 / 070 0333<br>RV 1 / 070 0337         |
| Inductive impulse Transmitter IN | -                                  | -                                       | IN 0,1 / 070 0315<br>IN 0,1 / 070 0319 | IN 1 / 070 0322<br>IN 1 / 070 0325 | IN 1 / 070 0328<br>RV 1 / 070 0331 | IN 1 / 070 0335<br>IN 1 / 070 0339         |
|                                  |                                    |                                         |                                        |                                    |                                    | Threaded<br>Flanged<br>Threaded<br>Flanged |

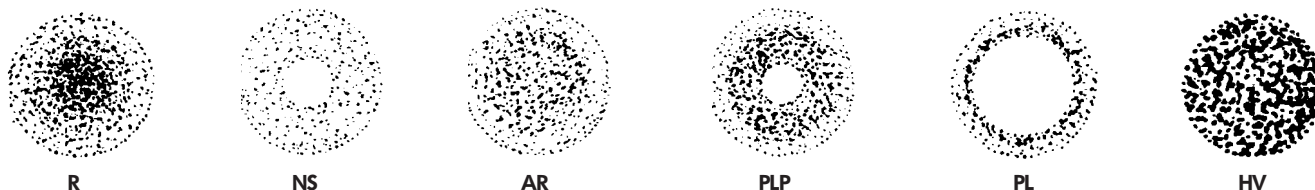
## Oil burner nozzles

7.0

Monarch produces oil burner nozzles for all oils with viscosity to 5 mm<sup>2</sup>/s (cSt). Special nozzles can be used for oils with a viscosity up to 13 mm<sup>2</sup>/s (cSt). You find nozzles for other fields of application in industry and farming in our special catalogue or on inquiry.



## Spray patterns



All MONARCH nozzles are stamped with the following characteristics, subject to modification on adoption of CEN standards:

- the flow (in USGPH at 100 PSI = 6.895 bar), (soon, capacity at 10 bar and CEN references);
- spray angle;
- the, reference MTD-92;
- letters to identify the series of spray patterns;
- the, MONARCH trade mark.

Each MTD-92 nozzle is individually tested at several different production stages to assure perfect conformity with master nozzles of each series.

The spray patterns (i.e. hollow cone or solid cone) described below refer to the tests carried out with a 60 °C angle at a 75 mm distance from the nozzle orifice. In nozzles of 60 °C spray angle or less, and for low flows in particular, the empty section of a hollow cone becomes smaller. The difference between hollow cone and solid cone practically disappears.

### Solid cone "R" series: .40 to 3.50 USGPH

This is the series supplied regularly unless customer specifies otherwise. It is a good all-round nozzle suitable for most burners. Atomization of the oil is not quite as fine as with the "NS" series.

### Hollow cone "NS" series: .50 to 2.00 USGPH

This series works best on many burners due to its exceptionally fine atomization. Produces a quiet stable flame. Widely used in 80 °C and 90 °C on flame retention burners.

### Special solid cone "AR" series: .50 to 3.50 USGPH

This series has become widely used due to its success in obtaining quiet combustion in some flame retention head burners. Traditionally a "cure-all" replacement nozzle, it now is increasingly specified on original equipment.

### Semi-solid cone "PLP" series: 2.25 to 100.00 USGPH

The standard nozzle for larger capacities. Fine atomization and "solid" spray pattern up to about 3.50 USGPH, gradually becoming more and more "hollow" in the larger sizes.

### Hollow cone "PL" series: 2.25 to 50.00 USGPH

This series represents an extension of the "NS" type spray pattern to larger capacity sizes. Spray is not as finely atomized as the "PLP" series, but produces the best results in equipment specifying hollow cone nozzles.

### Narrow spray angle "HV" series: 1.65 to 60.00 USGPH

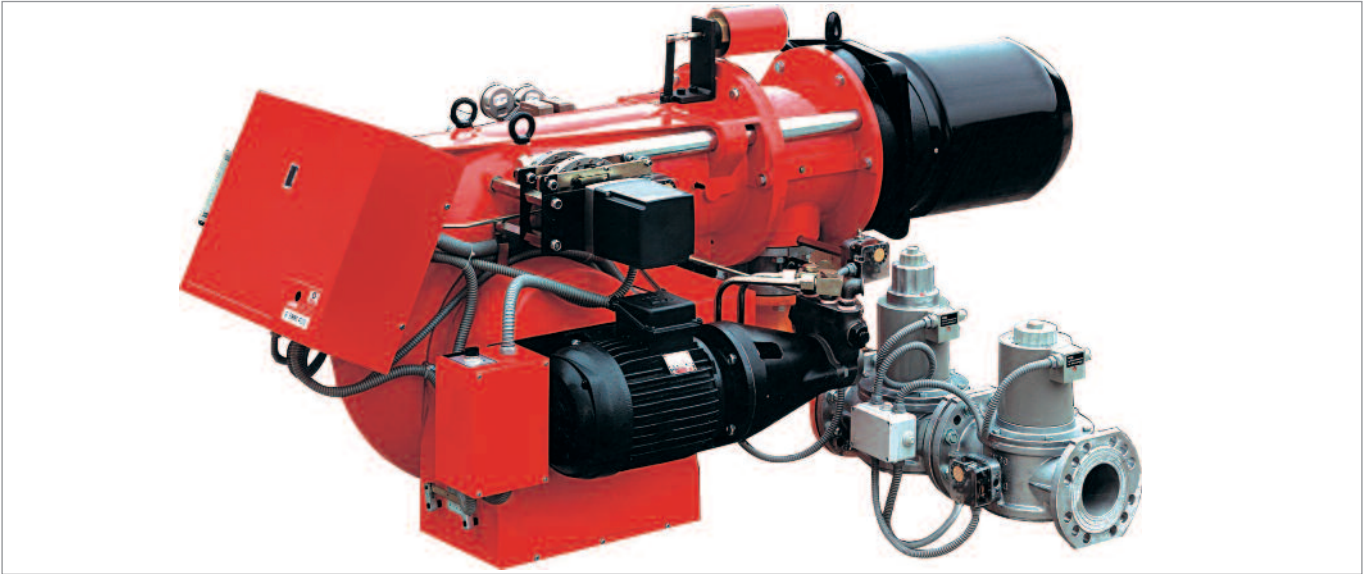
Used mostly for Semi-Industrial or Scotch Marine applications where narrow spray angle and high spray velocity is essential and some combustion noise is not objectionable.

### Heavy oil nozzle "HO" series: 1.25 to 100.00 USGPH

Designed for use on 70 SSU (approx. 13 centistokes) operating viscosity oil at operating pressures ranging from 200-450 PSIG (13.8 to 31 bar). Write for special data sheet.

## Special aggregates

8.0



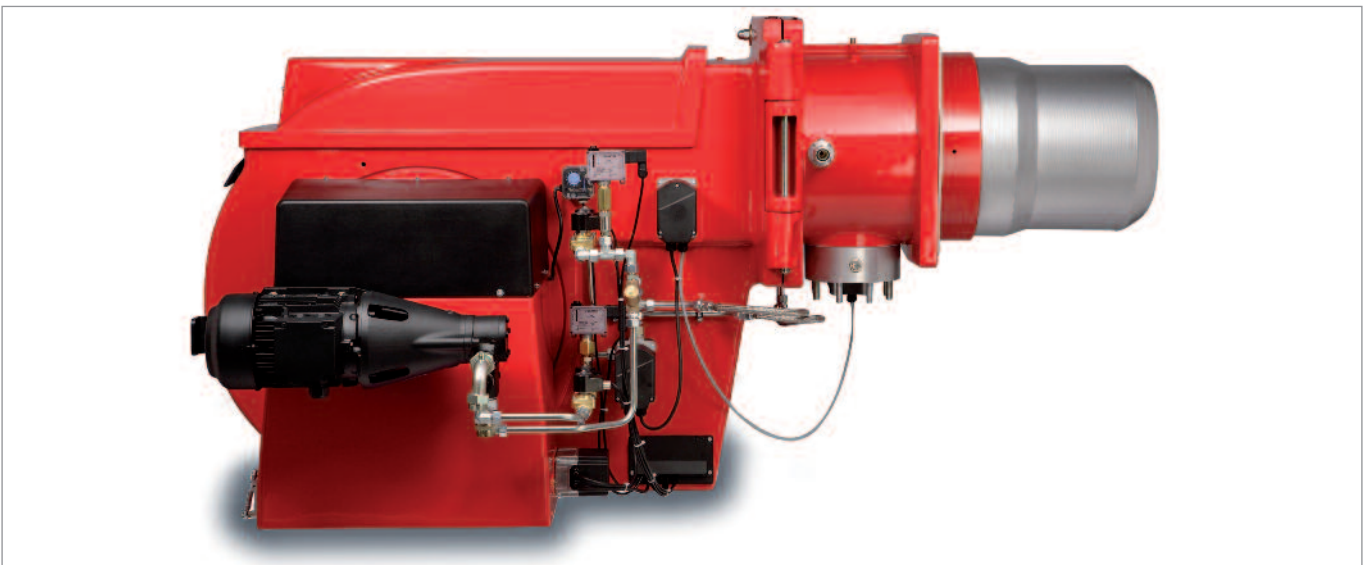
Burner from Riello with hp-Motor pump group SMG



Burner from Dreizler with hp-Motor pump group SMG



Test panel for pumps



Burner from Weishaupt, series RGL 70/1-B



## hp-TECHNIK GmbH General conditions of sale, shipping and payment

### § 1 Range of application and scope

The following terms are valid for all our sales transactions with all our customers, to be precise independent of any concrete indication in particular case for all further legal transactions. Contractual conditions of the customer, particularly in order confirmations but also in any other correspondence will not be accepted unless we would have expressly agreed to them.

### § 2 Conclusion of a contract

1. Our catalogues, indications on our CR-ROM and any other product descriptions serve as information and contain no offer in legal sense. The inquiry is to be made by the customer. We are entitled to accept an offer of the customer within a period of 2 weeks.
2. The contract just comes into being by our written order confirmation or by handing over or delivery of the goods.

### § 3 Prices and terms of payment

1. We only accept payment in advance. Bills of exchange, will not be accepted, cheques and credit cards only in case of special agreements and confirmation of cover.

### § 4 Deliveries

1. Delivery dates and delivery times which can be arranged binding and non-binding are to be made in writing.
2. The dispatch of the goods is only effected on the basis of special agreements and only at the customer's risk and expense. Freight charges are to be advanced by the customer. If delivery is delayed at the customer's request, the risk will pass on to him with announcing of being ready to take delivery.
3. If we are behind in our performances, the claim for compensation is limited to 5 % of the invoice value of the performance concerned. Should the customer, on the basis of legal conditions and on expiry of an appropriate period of grace, claim for compensation instead of the performance or if the performance becomes impossible for us during the delay in delivery, the customer's claim is – in case of slight negligence – limited to a maximum of 10 % of the agreed purchase price. This is not valid if fixed dates have been arranged for the performance we are responsible for. In any case we reserve the right to prove a smaller damage, the customer reserves the right of proving a higher damage than the flat rate.
4. All consignments are insured by us, we thus charge for every order a participation in freight insurance of 2,50 €.

### § 5 Defects / Guarantee

1. The subject matter of the contract is exclusively the purchased item with its features and application in accordance with the manufacturer's product description well-known to the customer. The customer has the possibility to see the corresponding product description before the conclusion of the contract. Other or further features or another application are only regarded as agreed if they have been expressly confirmed by us in writing.
2. The customer is obliged to inform us immediately and in writing of detected defects. This applies also to those defects which are revealed after a repair attempt. The customer is obliged to inform us about defects which could not be considered as hidden defects within 5 days after purchase. Hidden defects have to be communicated to us within 5 days after their detection. If the customer did not inform us by expiry of this deadline, the goods are considered as accepted free of defects.

3. The customer's claim to subsequent compliance of the contract stipulated in law is to be answered at our choice either by subsequent delivery (substitute delivery) or repair.
4. Customer's claims regarding material defects come under the statute of limitations one year after the delivery of the goods to the customer.
5. Claims of the customer as regards bodily harm as well as in case of deceitful concealing of a defect or if taking over of a warranty for the composition or a risk of acquisition are always accepted.
6. We will accept return deliveries only after prior agreement (the customer must request the return number), in the original packaging, with a copy of the invoice, with the reason for the complaint, and carriage free. We reserve the right to charge a labour cost flat rate.

### § 6 Liability

1. In all cases of breach of contractual or advance contractual terms or of legal obligations we are only liable in case of intention or gross negligence.
2. In case of a merely negligent breach of an obligation by us or by our agent of vicarious liability we are only liable in case of breach or nonfulfilment of essential duties of the contract and only on the contract typical, foreseeable damage.
3. The liability for deceitful concealing of a defect, for taking over of the warranty or a risk of acquisition according to the product liability law and for bodily harms remains is always accepted.
4. The liability for delay in delivery is regulated in § 4.
5. Excluded is the personal liability of our legal representatives, agents of vicarious and company staff for damages they caused by slight negligence

### § 7 Concluding terms

1. The contract including terms of sale, delivery and payment is exclusively based on and judged according to German right, even if the customer's company is based in a foreign country or if it concerns an export business.
2. Place of jurisdiction for all arguments concerning the legal relationship is the court responsible for Karlsruhe.
3. Should single parts of the above terms be null and void, all other conditions remain valid. The contractual parts shall give, if possible an appropriate effective version to an invalid regulation which corresponds to its economical purpose.

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