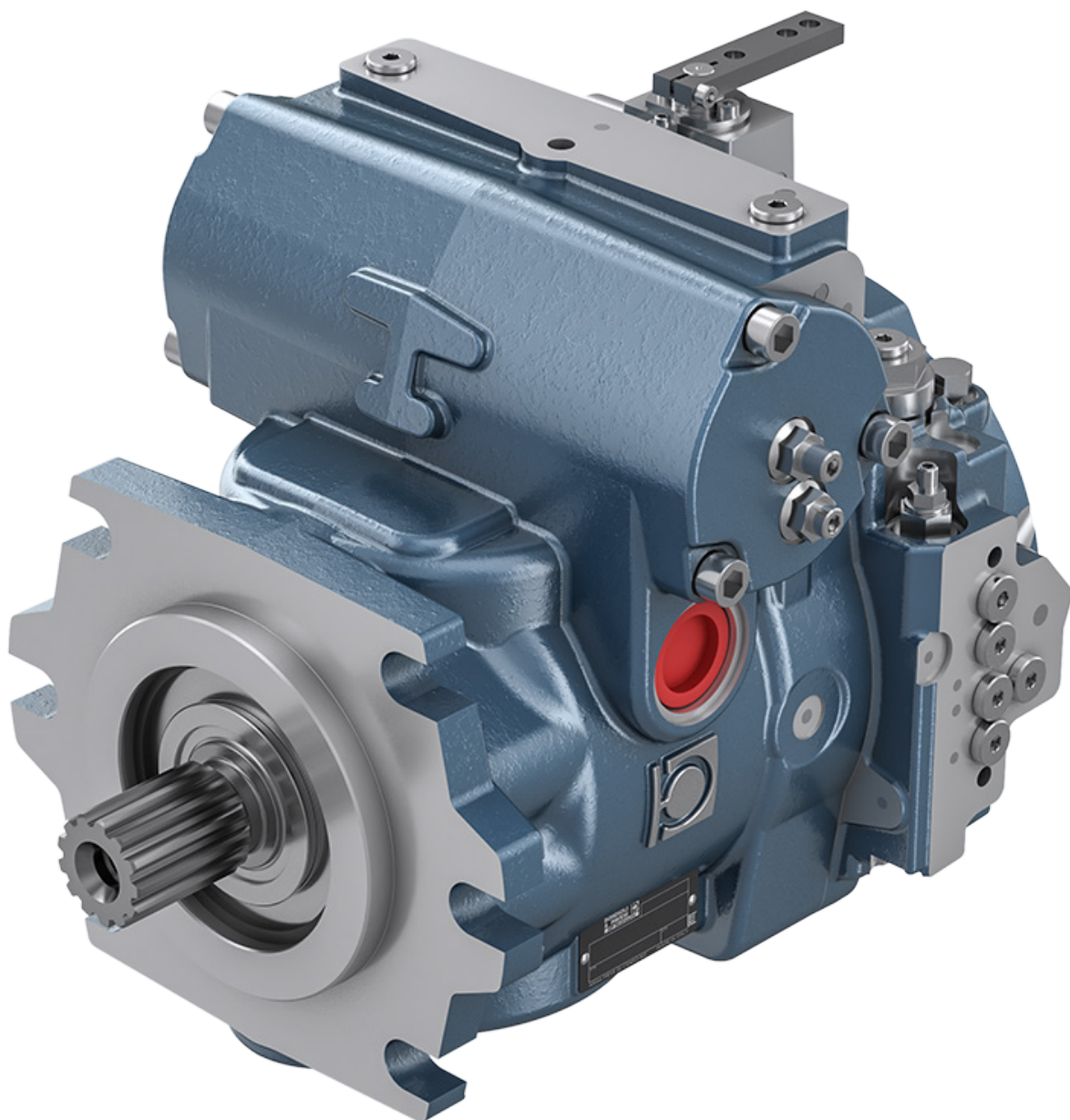
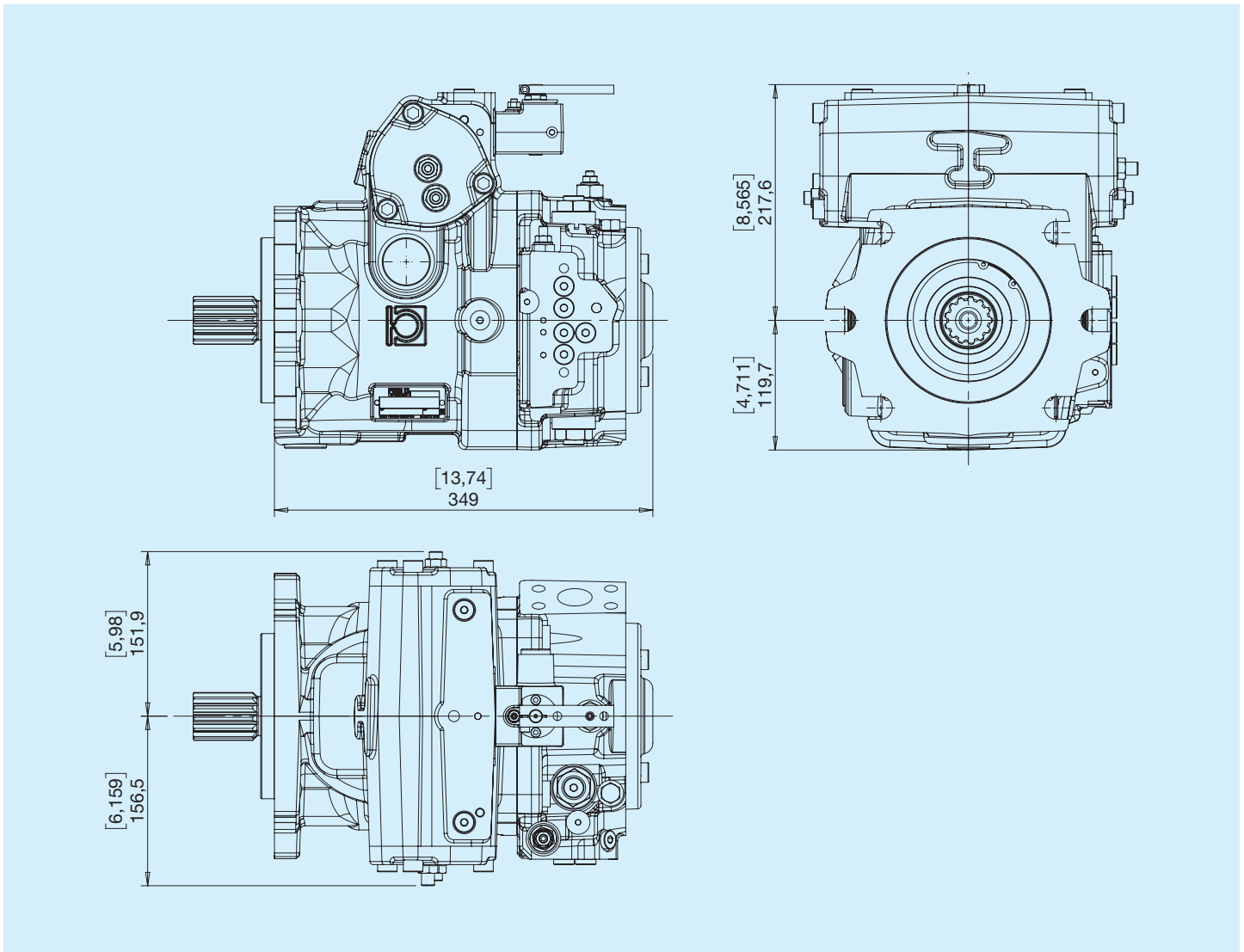


## Variable-displacement pumps



Before using the axial piston pumps and motors, carefully read the GENERAL INSTRUCTIONS FOR USE OF CLOSED CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

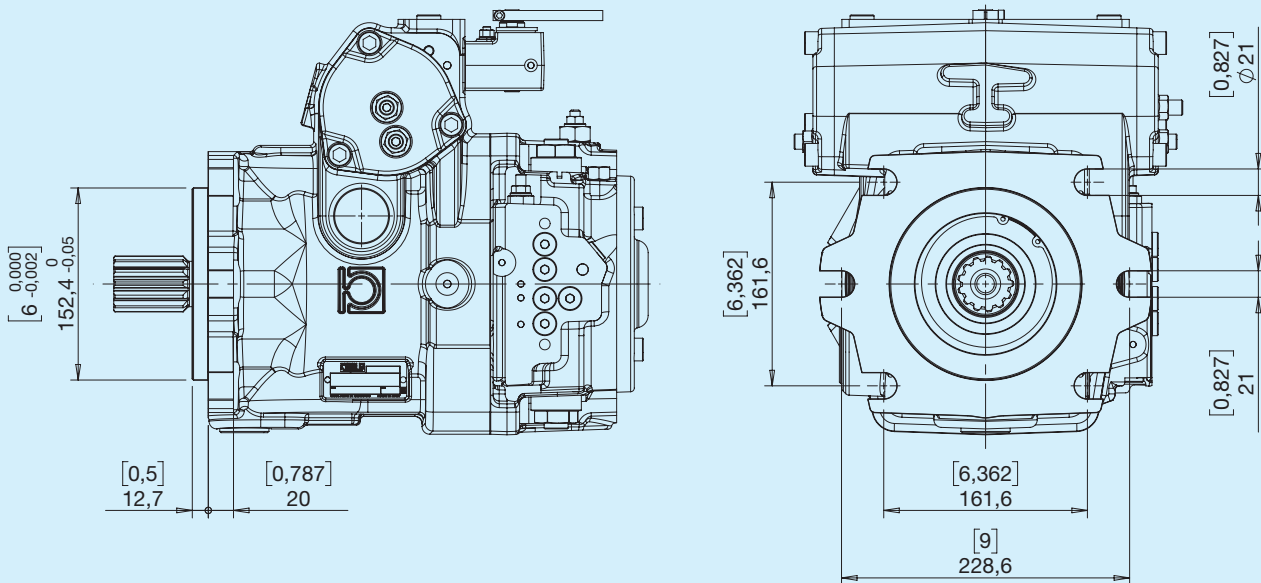


| HPP8A      | Nominal displacement |                 | Swash plate | Continuous pressure |      | Intermittent pressure |      | Peak pressure |      | Rotational speed      |                       | Weight |       |
|------------|----------------------|-----------------|-------------|---------------------|------|-----------------------|------|---------------|------|-----------------------|-----------------------|--------|-------|
|            | cm <sup>3</sup>      | in <sup>3</sup> |             | bar                 | psi  | bar                   | psi  | bar           | psi  | MAX min <sup>-1</sup> | MIN min <sup>-1</sup> | kg     | lbs   |
| <b>145</b> | 145                  | 8.85            | 18          | 450                 | 6525 | 480                   | 6960 | 500           | 7250 | 2800                  | 500                   | 95     | 209.4 |
| <b>180</b> | 180                  | 10,98           | 18          | 400                 | 5800 | 420                   | 6090 | 450           | 6525 | 2800                  | 500                   | 95     | 209,4 |

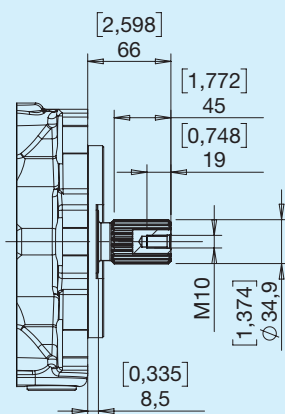
## Feed pump

| Type     | Feed pump displacement |                 | Pressure |     |
|----------|------------------------|-----------------|----------|-----|
|          | cm <sup>3</sup>        | in <sup>3</sup> | bar      | psi |
| HPP9     | 34                     | 2.07            | 25       | 363 |
| HPP9 180 | 34                     | 2,07            | 25       | 363 |

**D** SAE D

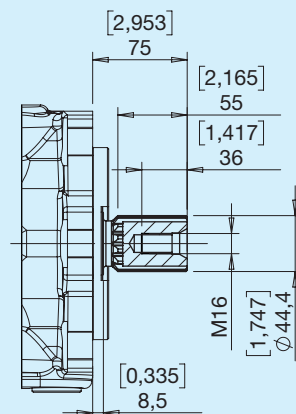


## 7 SAE 21T 16/32 DP

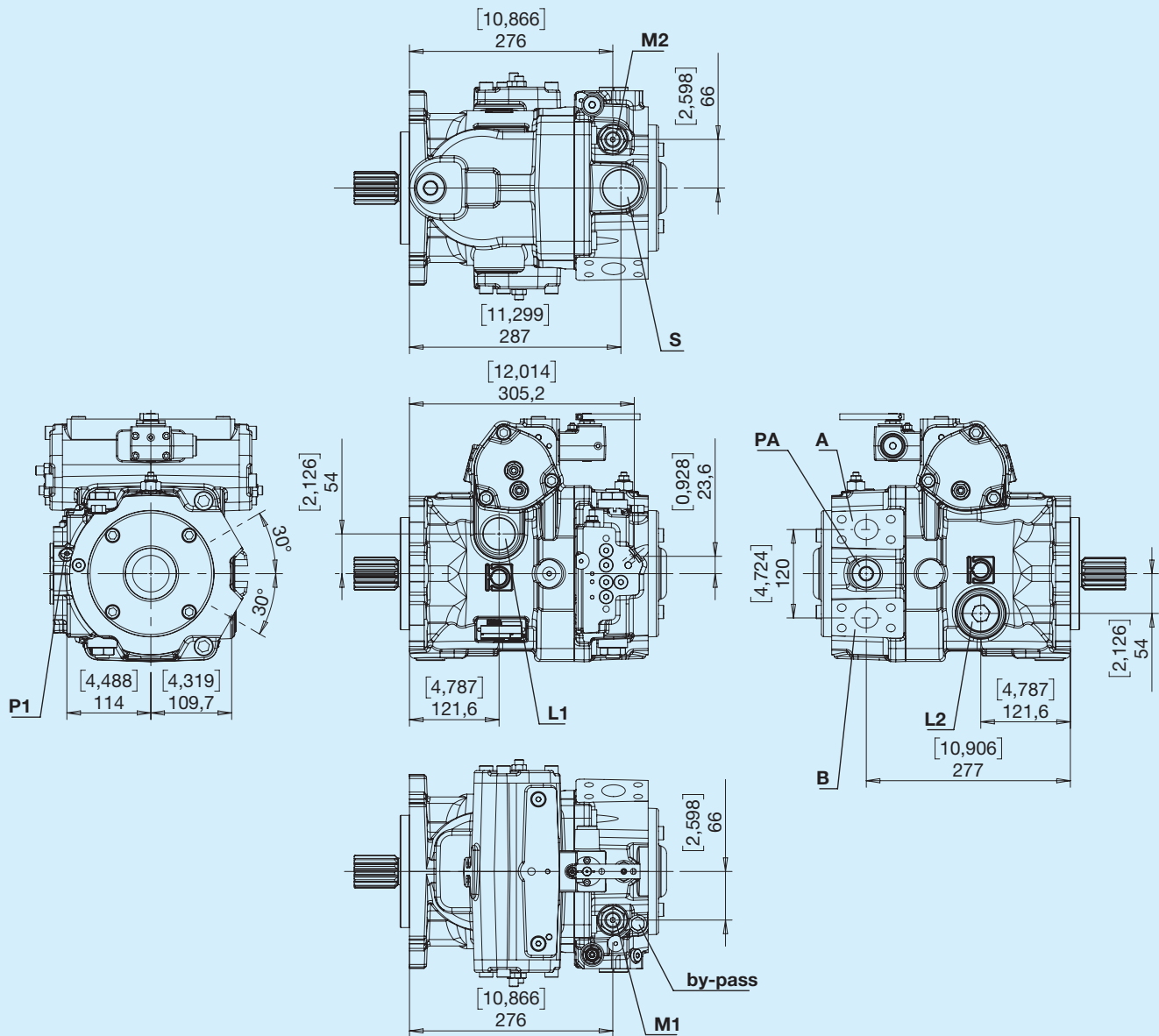


Max. torque 1200 Nm

## 9 SAE 13T 8/16 DP



Max. torque 2600 Nm



**A,B** - Use

**L1, L2** - Drain port

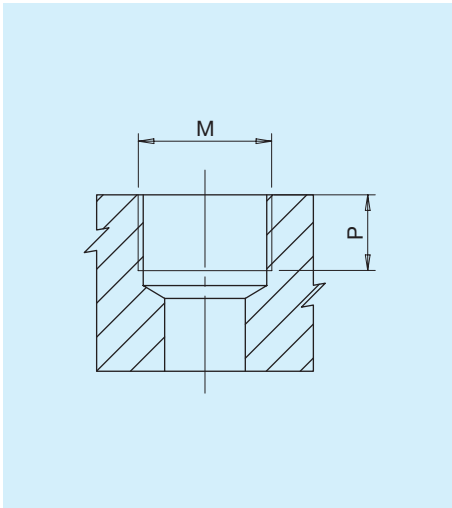
**S** - Inlet

**P** - Pressure intake

**M1, M2** - Manometer intake

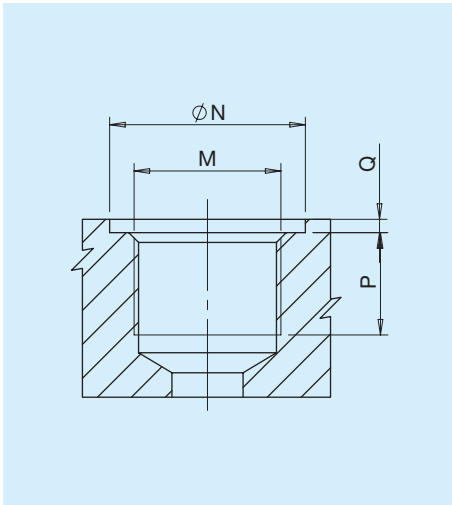
**PA** - Mandata esterna PA

## Type G



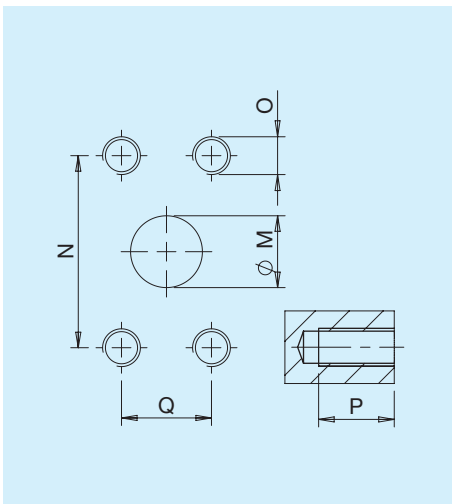
| Type | M                         | Nm  | P  |      |
|------|---------------------------|-----|----|------|
|      |                           |     | mm | in   |
| G2   | Port ISO 1179-1 - G 1/4   | 17  | 12 | 0.47 |
| G7   | Port ISO 1179-1 - G 1     | 160 | 18 | 0.71 |
| G8   | Port ISO 1179-1 - G 1 1/4 | 200 | 21 | 0.83 |
| G9   | Port ISO 1179-1 - G 1 1/2 | 210 | 25 | 0.98 |

## Type M



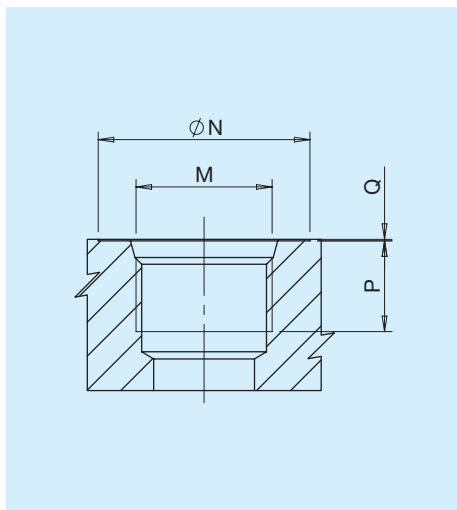
| Type | M                           | Nm  | N  |      | P  |      | Q   |      |
|------|-----------------------------|-----|----|------|----|------|-----|------|
|      |                             |     | mm | in   | mm | in   | mm  | in   |
| M1   | Port ISO 6149 - 1 - M12x1.5 | 17  | 22 | 0.87 | 12 | 0.47 | 0.3 | 0.01 |
| mA   | Port ISO 6149 - 1 - M33x2   | 160 | 44 | 1.73 | 23 | 0.91 | 0.3 | 0.01 |
| MD   | Port ISO 6149 - 1 - M42x2   | 200 | 55 | 2.17 | 20 | 0.79 | 0.3 | 0.01 |
| ME   | Port ISO 6149 - 1 - M48x2   | 210 | 57 | 2.24 | 23 | 0.91 | 0.3 | 0.01 |

## Type N



| Type | M  |      | N    |      | Q    |      | P  |      | O   |     |
|------|----|------|------|------|------|------|----|------|-----|-----|
|      | mm | in   | mm   | in   | mm   | in   | mm | in   |     | Nm  |
| N8   | 32 | 1.26 | 66.7 | 2.63 | 31.8 | 1.25 | 22 | 0.87 | M14 | 120 |

## Type U



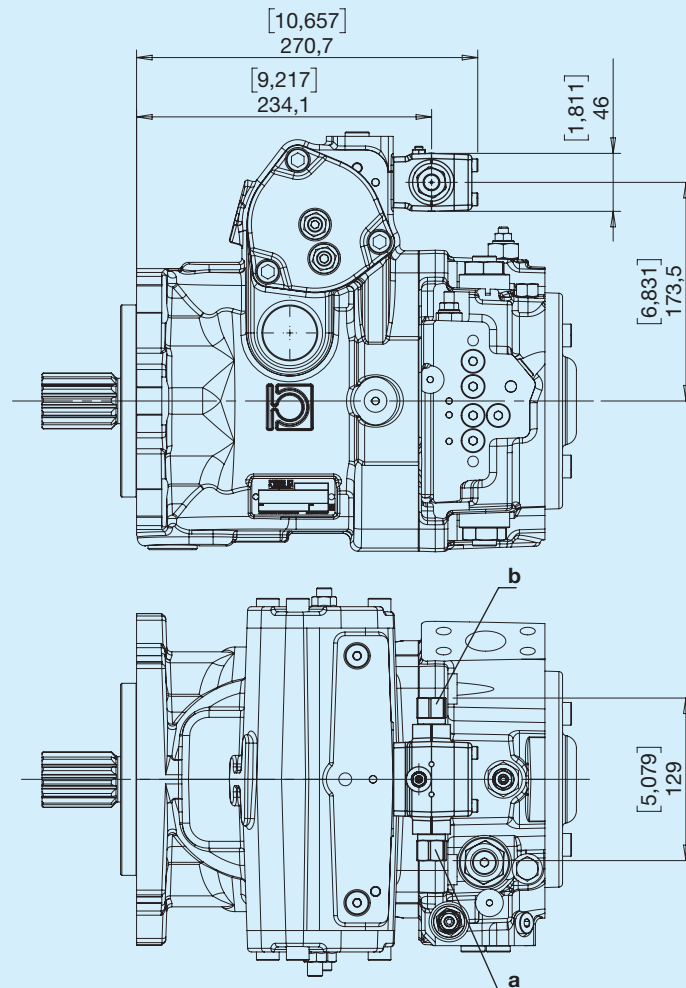
| Type | Dim.   | N  |      | P  |      | Q   |      | M                          | Nm  |
|------|--------|----|------|----|------|-----|------|----------------------------|-----|
|      |        | mm | in   | mm | in   | mm  | in   |                            |     |
| U2   | 1/4'   | 22 | 0.87 | 12 | 0.47 | 0.3 | 0.01 | Port ISO 11926-1-7/16-20   | 17  |
| U7   | 1'     | 49 | 1.93 | 20 | 0.79 | 0.3 | 0.01 | Port ISO 11926-1-1 5/16-12 | 160 |
| U8   | 1 1/4' | 58 | 2.28 | 20 | 0.79 | 0.3 | 0.01 | Port ISO 11926-1-1 5/8-12  | 200 |
| U9   | 1 1/2' | 68 | 2.68 | 20 | 0.79 | 0.3 | 0.01 | Port ISO 11926-1-1 7/8-12  | 210 |

## Combinations

| Type     | Inlet<br><b>S</b> | Outlet<br><b>A-B</b> | Drain port<br><b>L1-L2</b> | HP ext. outlet<br><b>PA</b> | Pressure intake<br><b>P1</b> | Pressure gauge<br>sockets<br><b>M1 - M2</b> |
|----------|-------------------|----------------------|----------------------------|-----------------------------|------------------------------|---------------------------------------------|
| <b>G</b> | G9                | N8                   | G8                         | G2                          | G2                           | G2                                          |
| <b>U</b> | U6                | N8                   | U6                         | G2                          | U2                           | U2                                          |
| <b>M</b> | ME                | N8                   | MD                         | MA                          | M1                           | G2                                          |



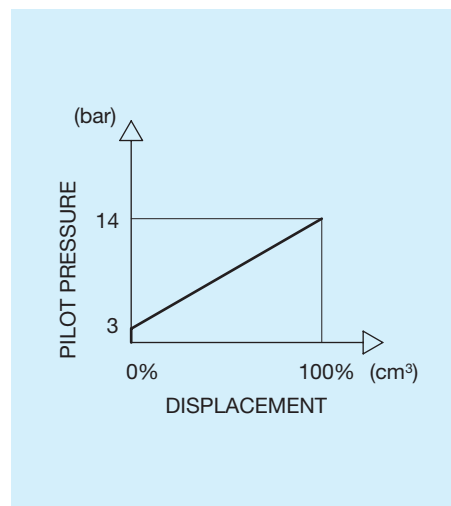
## G Feedback hydraulic



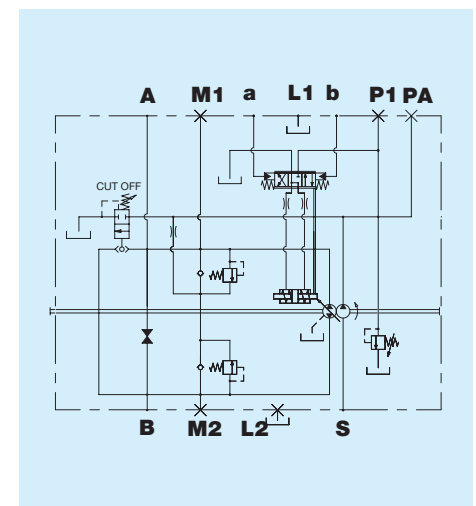
### Outlet

| Rotation | Pilot | Outlet |
|----------|-------|--------|
| Right    | b     | B      |
| Right    | a     | A      |
| Left     | b     | A      |
| Left     | a     | B      |

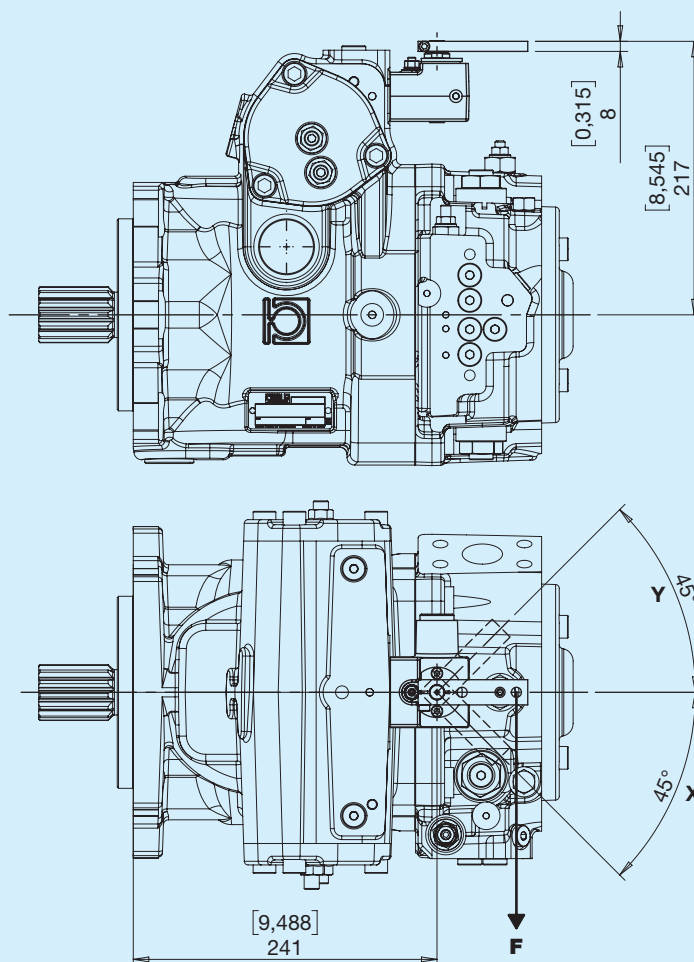
### Pilot pressure



### Hydraulic diagram



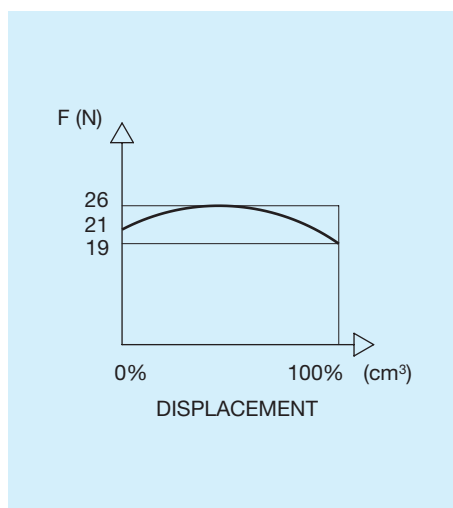
## I Lever-operated hydraulic



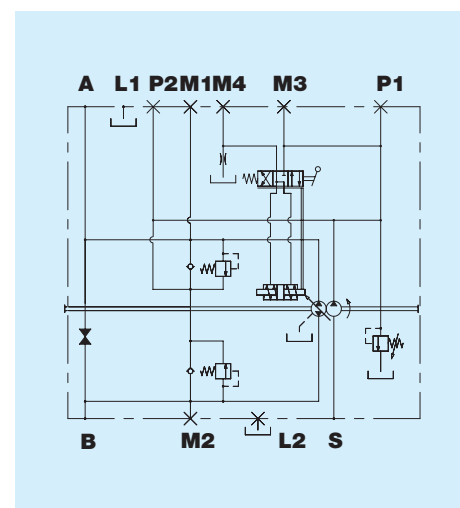
### Outlet

| Rotation | Control lever | Outlet |
|----------|---------------|--------|
| Right    | Y             | B      |
| Right    | X             | A      |
| Left     | Y             | A      |
| Left     | X             | B      |

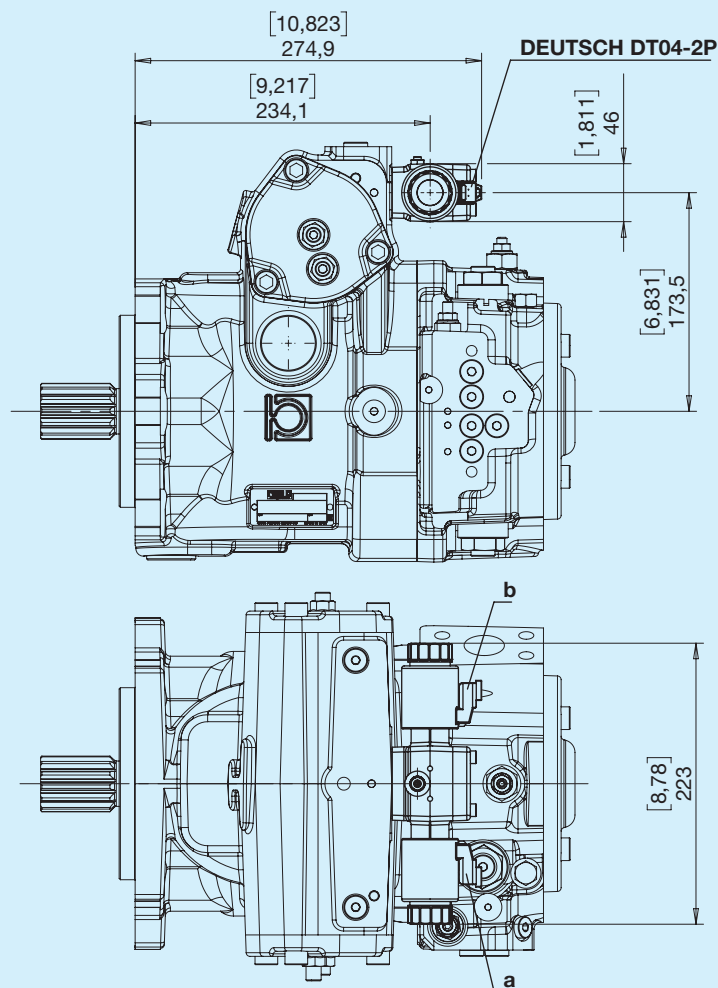
### Pilot pressure



### Hydraulic diagram



## **O** Electronic proportional feedback control 12V



Available on request with DIN 43650 connectors

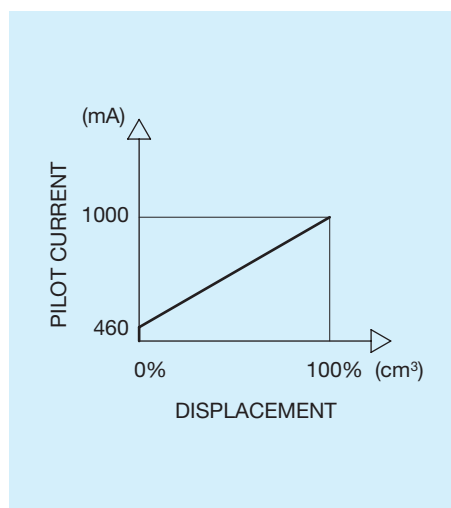
### Outlet

| Rotation | Excited solenoid | Outlet |
|----------|------------------|--------|
| Right    | a                | A      |
| Right    | b                | B      |
| Left     | a                | B      |
| Left     | b                | A      |

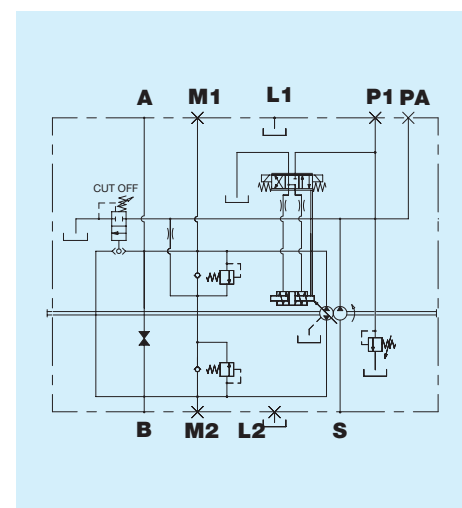
### Control

|                   |      |    |
|-------------------|------|----|
| Rated voltage     | 12   | V  |
| Min. current (I1) | 700  | mA |
| Max. current (I2) | 2000 | mA |
| PWM frequency     | 100  | Hz |

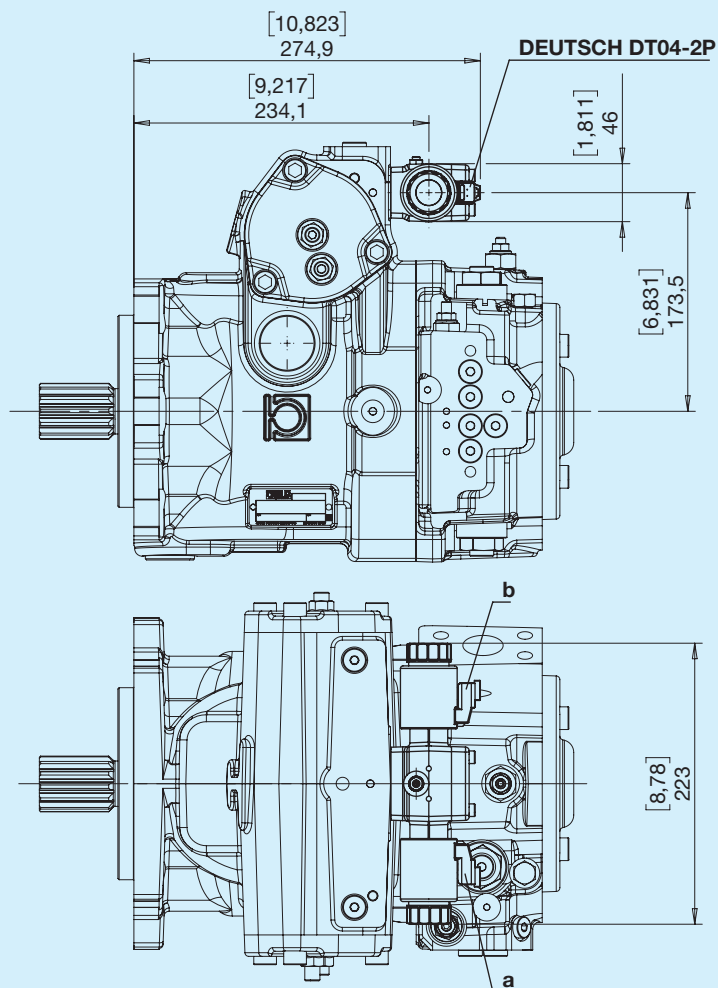
### Pilot pressure



### Hydraulic diagram



## V Electronic proportional feedback control 24V



Available on request with DIN 43650 connectors

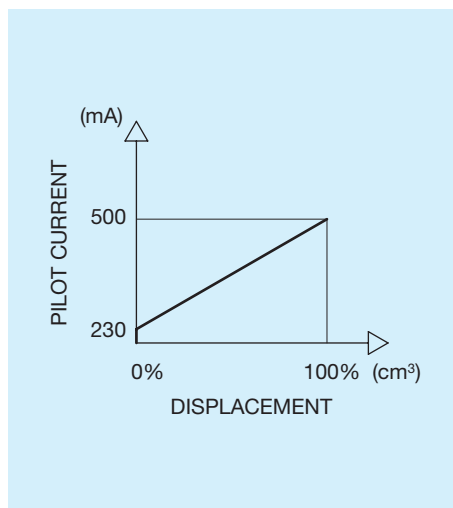
### Outlet

| Rotation | Excited solenoid | Outlet |
|----------|------------------|--------|
| Right    | a                | A      |
| Right    | b                | B      |
| Left     | a                | B      |
| Left     | b                | A      |

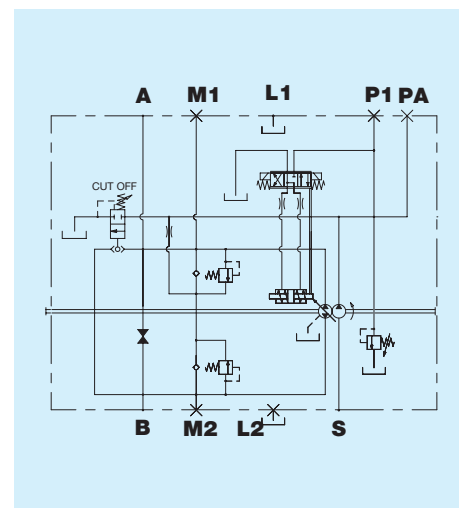
### Control

|                   |      |    |
|-------------------|------|----|
| Rated voltage     | 24   | V  |
| Min. current (I1) | 350  | mA |
| Max. current (I2) | 1000 | mA |
| PWM frequency     | 100  | Hz |

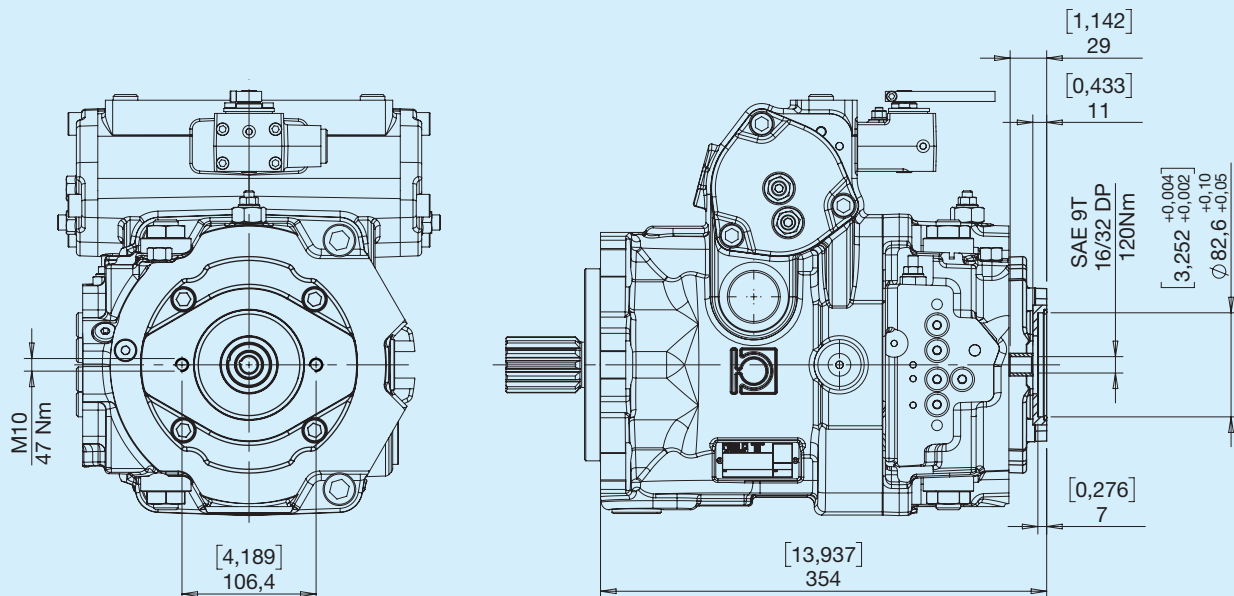
### Pilot pressure



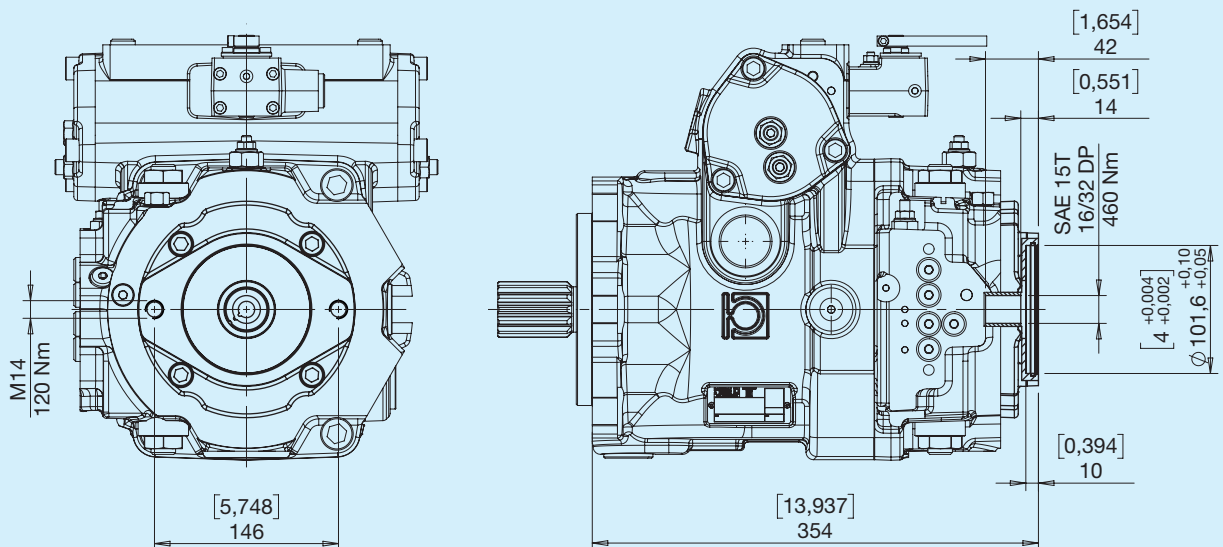
### Hydraulic diagram



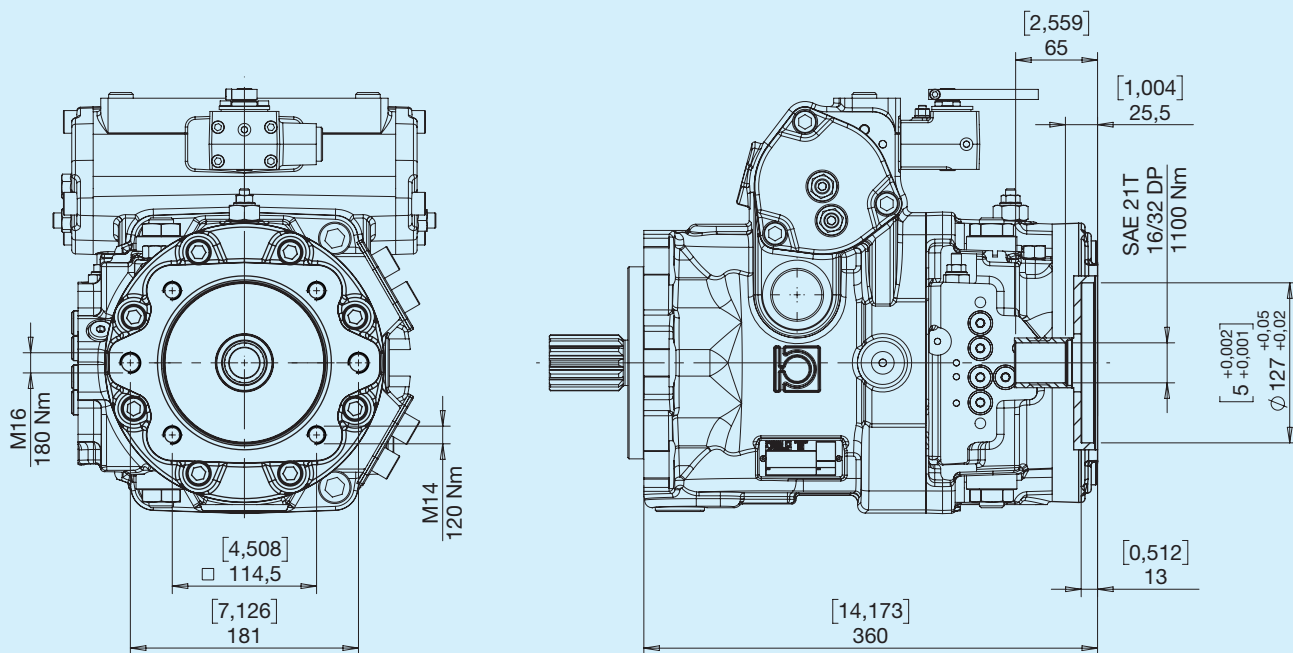
## 2 SAE A with boost pump



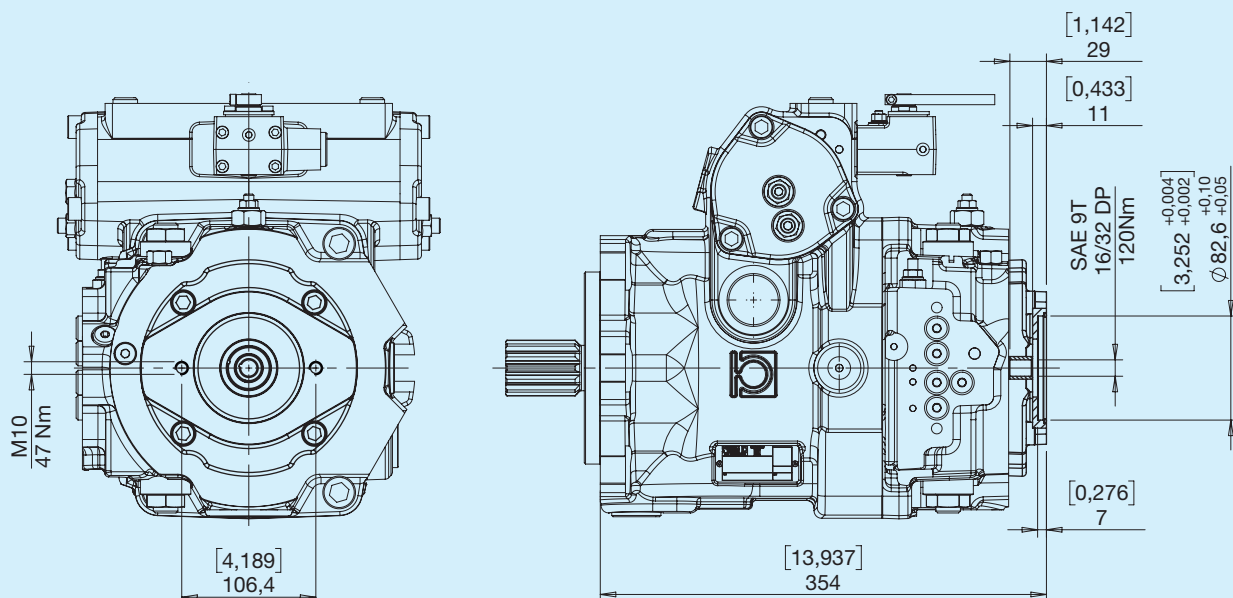
## 3 SAE B with boost pump



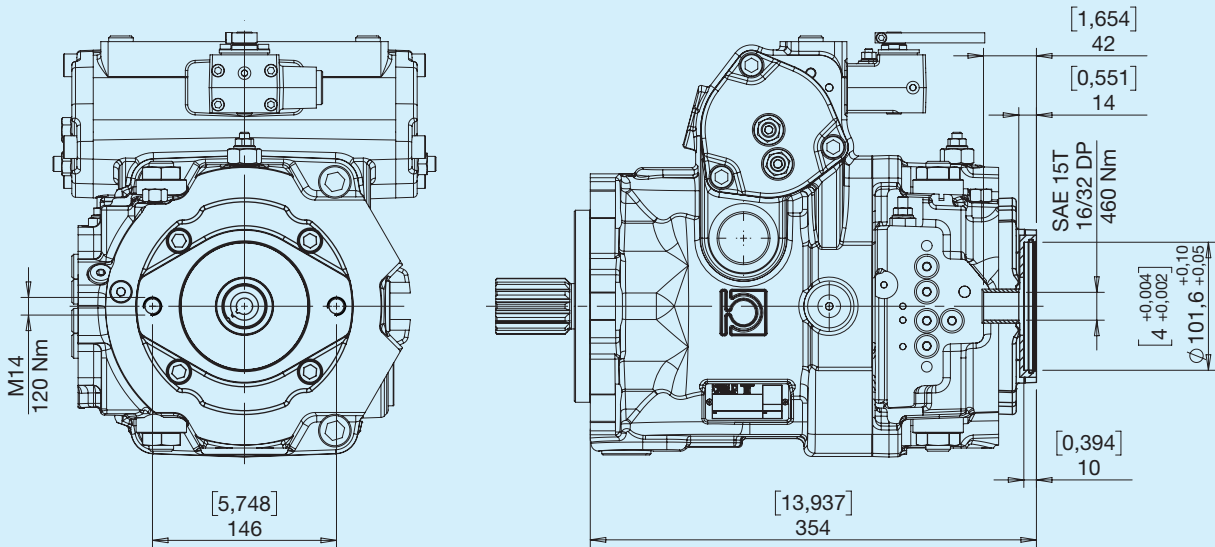
#### 4 SAE C with boost pump



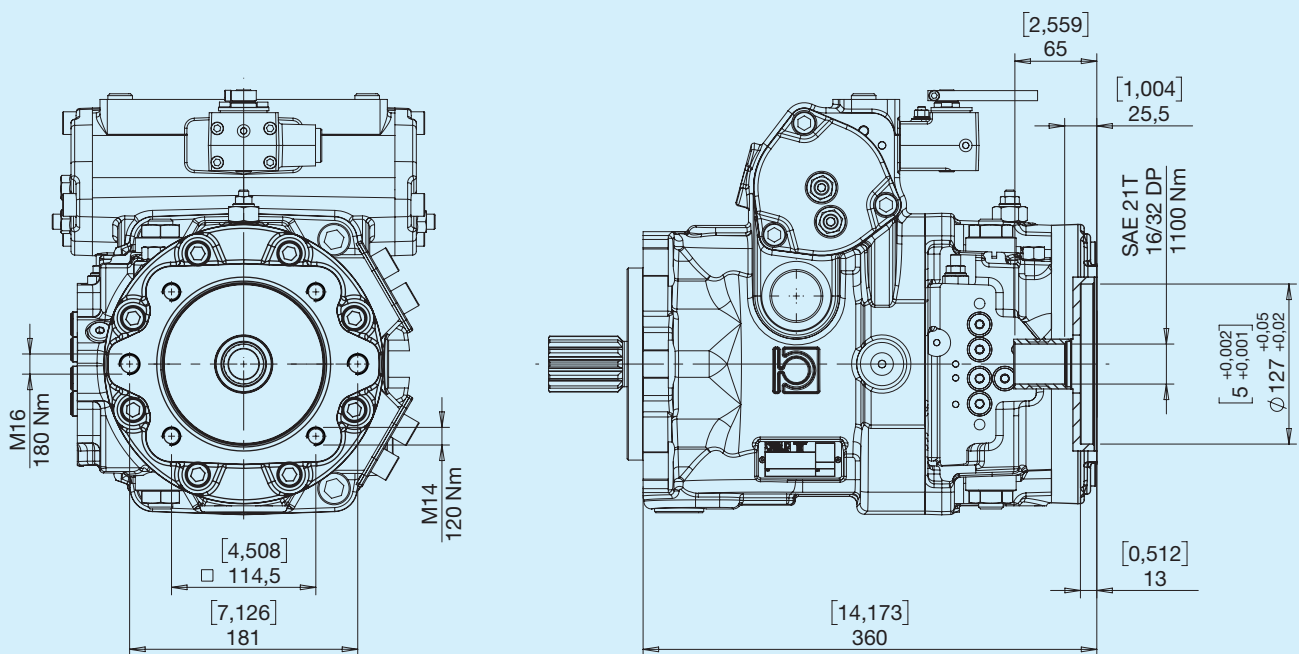
**5** SAE A without boost pump



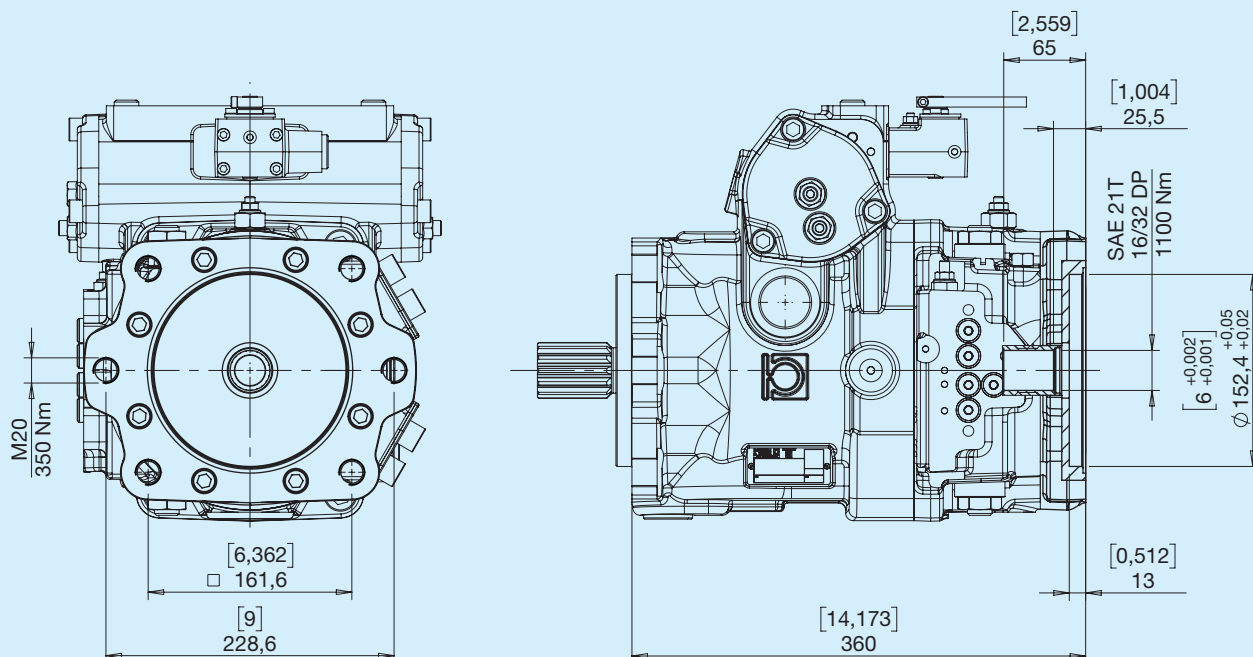
## 6 SAE B without boost pump



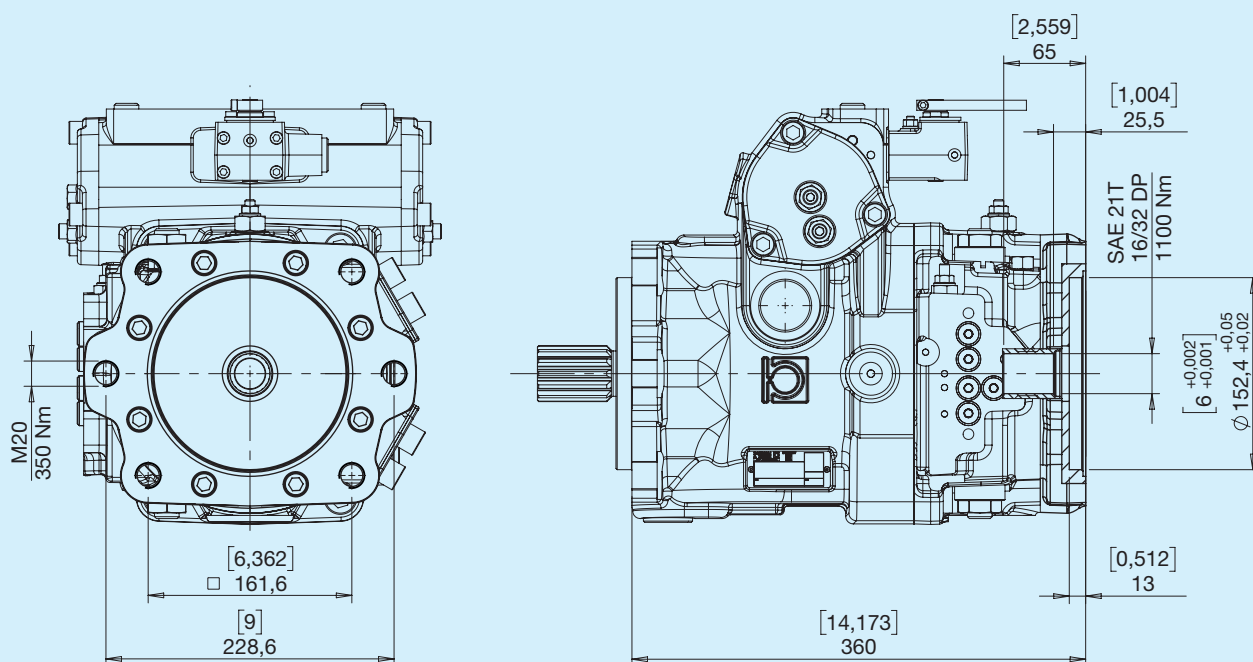
## 7 SAE C without boost pump



## 8 SAE D with boost pump

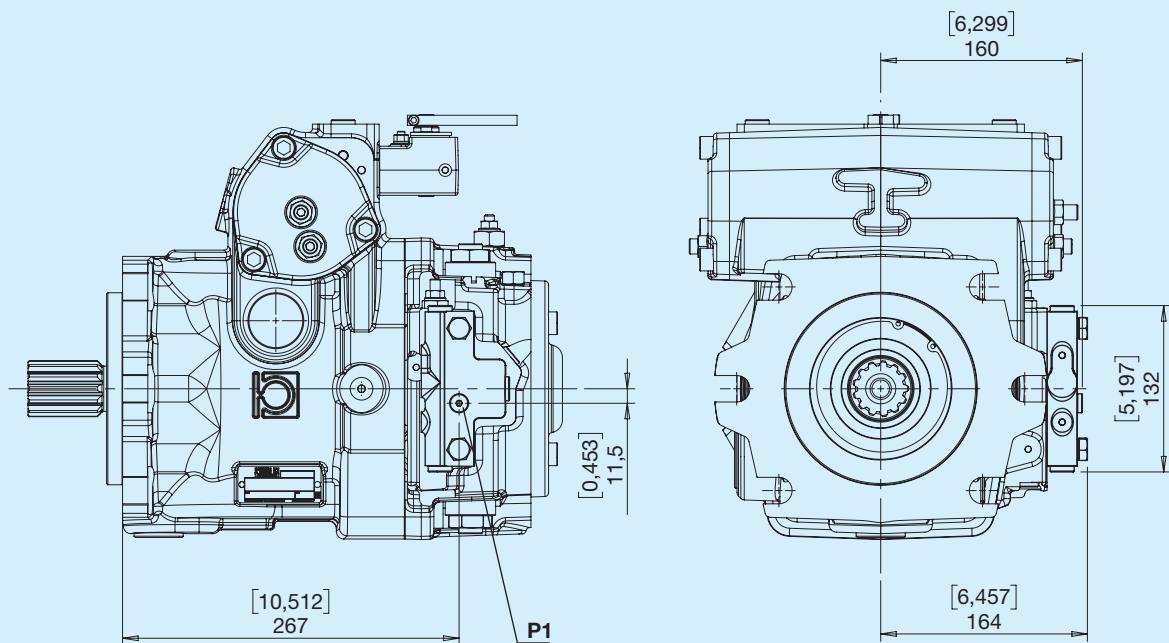


## 9 SAE D without boost pump



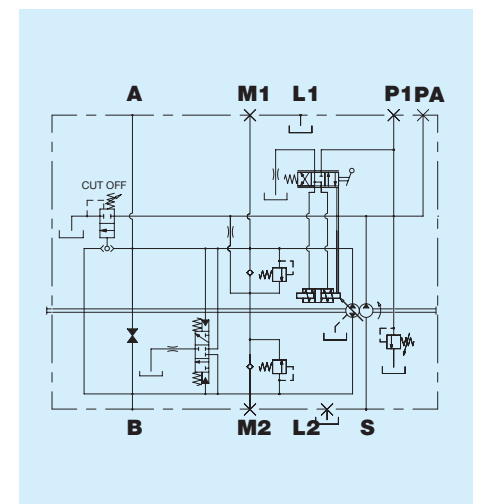


## V Flushing valve (10-12 l/min)



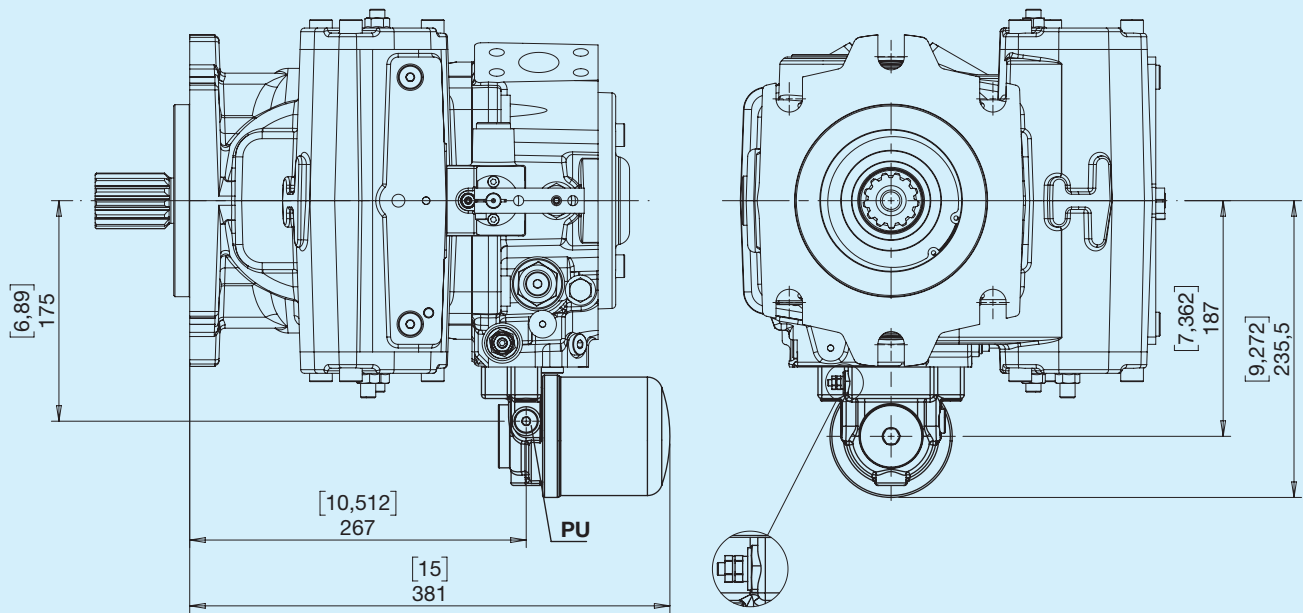
P1 - Pressure intake G1/8

## Hydraulic diagram



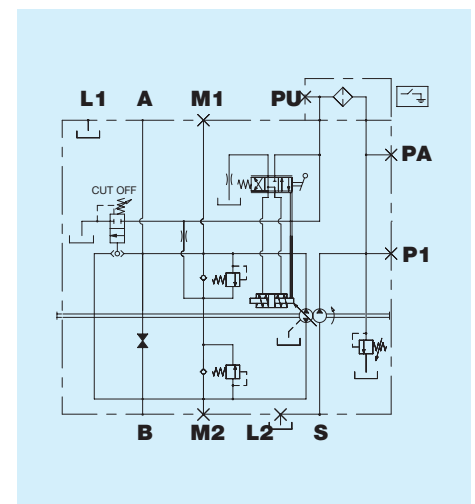
## X Filter with clogging indicator

Electric differential indicator - 30 VDC - 0.2 A max

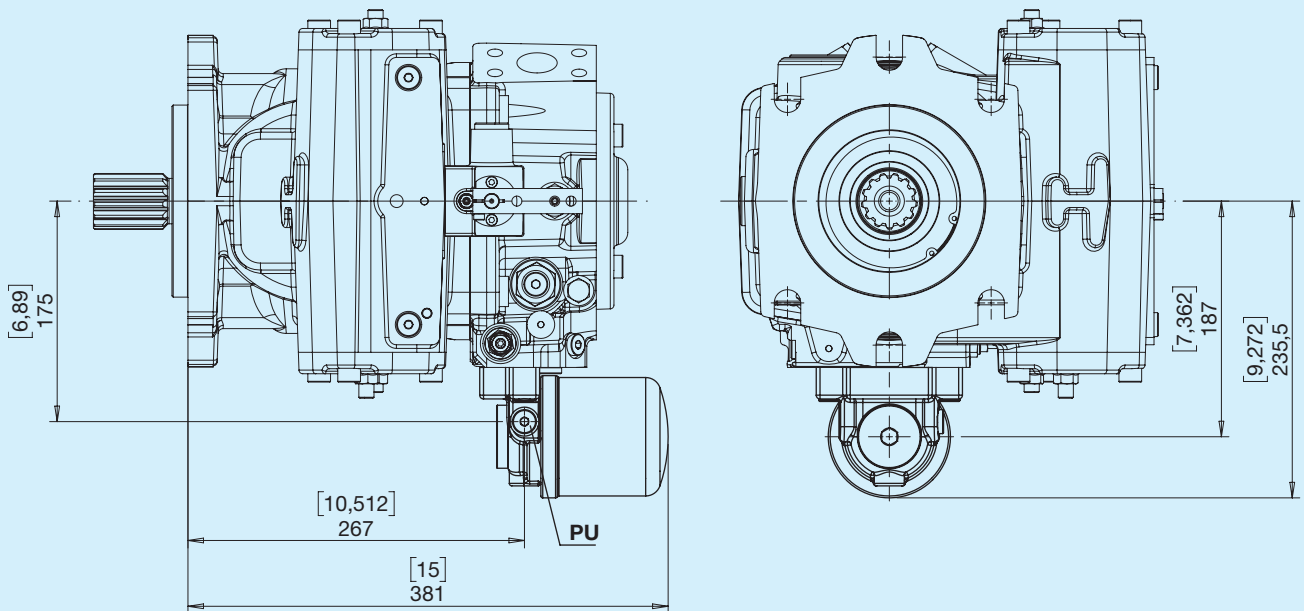


PU - Filtered oil intake G1/4

## Hydraulic diagram

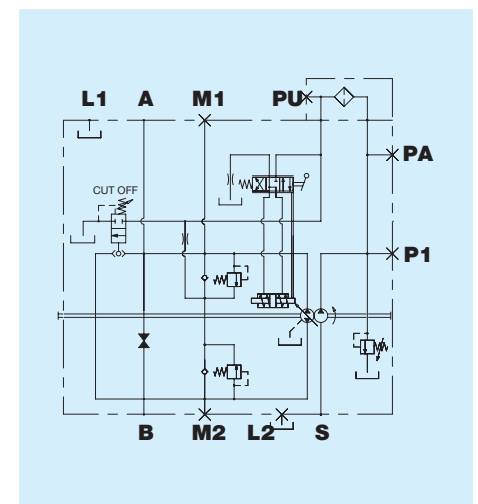


## **Y** Filter without electric clogging indicator



PU - Filtered oil intake G1/4

## Hydraulic diagram



|             | 1                                         | 2 | 3         | 4 | 5                                         | 4                 | 7         | 8 | 9                                              | 10 | 11       | 12 | 13                                             | 14 |
|-------------|-------------------------------------------|---|-----------|---|-------------------------------------------|-------------------|-----------|---|------------------------------------------------|----|----------|----|------------------------------------------------|----|
| <b>HPP9</b> |                                           |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
| 1 2 3       | Displacement                              |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | 145                                       |   |           |   | 145                                       |                   |           |   |                                                |    |          |    |                                                |    |
| 4           | Direction of rotation                     |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | R Right                                   |   |           |   |                                           | L Left            |           |   |                                                |    |          |    |                                                |    |
| 5           | Flanges                                   |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | D SAE D                                   |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
| 4           | Shaft profile                             |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | 7 SAE 21T 16/32 DP                        |   |           |   |                                           | 9 SAE 13T 8/16 DP |           |   |                                                |    |          |    |                                                |    |
| 7           | Type of ports                             |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | G Gas                                     |   |           |   |                                           | U Unf             |           |   |                                                |    | M Metric |    |                                                |    |
| 8           | Controls                                  |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | G Feedback hydraulic                      |   |           |   | I Lever-operated hydraulic                |                   |           |   | O Electronic proportional feedback control 12V |    |          |    | V Electronic proportional feedback control 24V |    |
| 9           | Valve calibration                         |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | I 280 bar                                 |   | O 350 bar |   | Q 420 bar                                 |                   | Y 500 bar |   |                                                |    |          |    |                                                |    |
|             | L 300 bar                                 |   | P 400 bar |   | R 450 bar                                 |                   |           |   |                                                |    |          |    |                                                |    |
| 10          | Versions                                  |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | 0 No special fittings, without boost pump |   |           |   | 3 SAE B with boost pump                   |                   |           |   | 6 SAE B without boost pump                     |    |          |    | 9 SAE D without boost pump                     |    |
|             | 1 No special fittings, with boost pump    |   |           |   | 4 SAE C with boost pump                   |                   |           |   | 7 SAE C without boost pump                     |    |          |    |                                                |    |
|             | 2 SAE A with boost pump                   |   |           |   | 5 SAE A without boost pump                |                   |           |   | 8 SAE D with boost pump                        |    |          |    |                                                |    |
| 11          | Accessories                               |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | 0 No option                               |   |           |   | V Flushing valve                          |                   |           |   | Y Filter without electric clogging indicator   |    |          |    | Y Filter without electric clogging indicator   |    |
|             | V Flushing valve                          |   |           |   | X Filter with electric clogging indicator |                   |           |   |                                                |    |          |    |                                                |    |
| 12 13 14    | Special versions                          |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |
|             | ...                                       |   |           |   |                                           |                   |           |   |                                                |    |          |    |                                                |    |