Rexroth
Bosch Group

# Axial Piston
# Variable Double Pump A20VO

**RE 93 100/05.06** 1/16
Replace: 07.03

**Technical data sheet**

Series 1

| Sizes | Nominal pressure/ Peak pressure |
|---|---|
| 60 | 250/315 bar |
| 95...520 | 350/400 bar |

for open circuits

## Contents



## Features

- Variable pump with two axial piston rotary groups in swash-plate design for use in open circuit hydrostatic drives
- For use in mobile and stationary applications
- The pump consists of proven components from the A11VO (RE 92500), A10VO/53 (RE 92703) or A4VSO (RE 92050) variable pumps
- The pump operates under self-priming condition, with tank pressurisation or with charge pump (sizes 190...260)
- A wide variety of controls are available
- Setting of the constant power control is possible via external adjustments, even when the unit is operating (only with power contol).
- The pump is available with a through drive to mount a gear pump or a second axial piston pump
- Output flow is proportional to drive speed and pump displacement and is steplessly variable between maximum and zero displacement

# Ordering Code / Standard Program

| A20V | | O | | | / | 10 | | – | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 02 | 03 | 04 | 05 | | 06 | 07 | | 08 | 09 | 10 | 11 | 12 |

**Axial piston unit**

| | | |
|---|---|---|
| 01 | Swashplate design, variable (Back to back - design) | **A20V** |

| **Charge pump (impeller)** | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|
| 02 | without charge pump (no code) | ● | ● | – | – | ● | |
| | with charge pump | – | – | ● | ● | – | **L** |

**Operation**

| | | |
|---|---|---|
| 03 | Double pump, open circuit | **O** |

**Size**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 04 | ≈ Displacement $V_{g\,max}$ in $cm^3$ (per rotary group) | **60** | **95** | **190** | **260** | **520** | |

| **Control devices** | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|
| 05 | see RE 92703 (A10VO/53) | ● | – | – | – | – | |
| | see RE 92500 (A11VO) | – | ● | ● | ● | – | |
| | see RE 92050 (A4VSO) and RE 92060, RE 92064, RE 92076 | – | – | – | – | ● | |

**Series**

| | | |
|---|---|---|
| 06 | Series 1, Index 0 | **10** |

**Direction of rotation**

| | | | |
|---|---|---|---|
| 07 | viewed on shaft end | clockwise | **R** |
| | | counter-clockwise | **L** |

**Seals**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 08 | NBR (nitril-caoutchouc), shaft seal ring in FKM (fluor-caoutchouc) | ● | ● | ● | ● | – | **N** |
| | FKM (fluor-caoutchouc) | – | – | – | – | ● | **V** |

| **Shaft end** | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|
| 10 | Splined shaft DIN 5480 | – | ● | ● | ● | ● | **Z** |
| | Splined shaft, ANSI B92.1a-1976 | ● | ● | – | – | – | **S** |
| | | – | – | ● | ● | – | **T** |
| | Parallel keyed shaft, DIN 6885 | – | – | – | – | ● | **P** |

| **Mounting flange** | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|
| 09 | SAE J744 – 4-hole | ● | ● | ● | ● | – | **D** |
| | To fit flywheel housing (conformin to SAE J617) of internal combustion engine (details on request) | – | ● | ● | – | – | **G** |
| | ISO 3019-2 – 8-hole | – | – | – | – | ● | **H** |

| **Service line ports** | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|
| 11 | Two service line ports and one scution port at site, opposite (fastening thread metric) | ● | ● | ● | ● | – | **24** |
| | At the site two service line ports each, opposite and one suction port displaced by 90° (fastening thread metric) | – | – | – | – | ● | **26** |

| **Boost pump and through drive[1])** | | | **60** | **95** | **190** | **260** | **520** | |
|---|---|---|---|---|---|---|---|---|
| 12 | without boost pump, without through drive | | ● | ● | ● | ● | – | **N00** |
| | without boost pump, with through drive | | | | | | | |
| | Flange SAE J744 | Splined shaft hub | | | | | | |
| | 82-2 (A) | 5/8 in 9T 16/32DP (A) | ❍ | ❍ | ❍ | ❍ | – | **K01** |
| | 127-2 (C) | 1 1/4in 14T 12/24DP (C) | – | – | – | – | ● | **K07** |
| | with through drive shaft, without hub, without intermediate flange, closed by a cover | | – | – | – | – | ● | **K99** |

● = available ❍ = available on request – = not available

[1]) Please contact us

# Technical Data

**Table of values** (theoretical values, without efficiencies $\eta_{mh}$ and $\eta_v$; values rounded)

| Size | *without* **charge pump** *with* **charge pump** | | 60 | 95 | 190 | 260 | 520 |
|---|---|---|---|---|---|---|---|
| Displacement | $V_{g\,max}$ | $cm^3$ | 60 | 93,8 | 192,7 | 260 | 520 |
| (per rotary group) | $V_{g\,min}$ | $cm^3$ | 0 | 0 | 0 | 0 | 0 |
| Speed | | | | | | | |
| maximal [1]) at $V_{g\,max}$ | $n_{max}$ | $min^{-1}$ | 2700 | 2350 | 2500 [2]) | 2300 [2]) | 1450 |
| Speed max. [3]) | | | | | | | |
| at $V_g \leq V_{g\,max}$ | $n_{max}$ | $min^{-1}$ | 3200 | 2780 | 2500 | 2300 | 1720 |
| Flow | | | | | | | |
| at $n_{max}$ and $V_{g\,max}$ | $q_{v\,max}$ | L/min | 2x162 | 2x220 | 2x482 | 2x598 | 2x754 |
| Power at $q_{V\,max}$ and $\Delta p = 350$ bar | $P_{max}$ | kW | 135[4]) | 257 | 562 | 698 | 880 |
| Torque at $V_{g\,max}$ | | | | | | | |
| at long-term ($\Delta p = 350$ bar) | $T_{max}$ | Nm | 477 [4]) | 1045 | 2147 | 2897 | 5793 |
| max. perm., short term ($\Delta p = 400$ bar) | $T_{max}$ | Nm | 602 [4]) | 1194 | 2454 | 3310 | 6621 |
| Moment of inertia (of the rotating parts) | J | $kgm^2$ | 0,0113 | 0,0346 | 0,0604 | 0,0912 | 0,696 |
| Mass approx. | m | kg | 44 | | | | 640 |

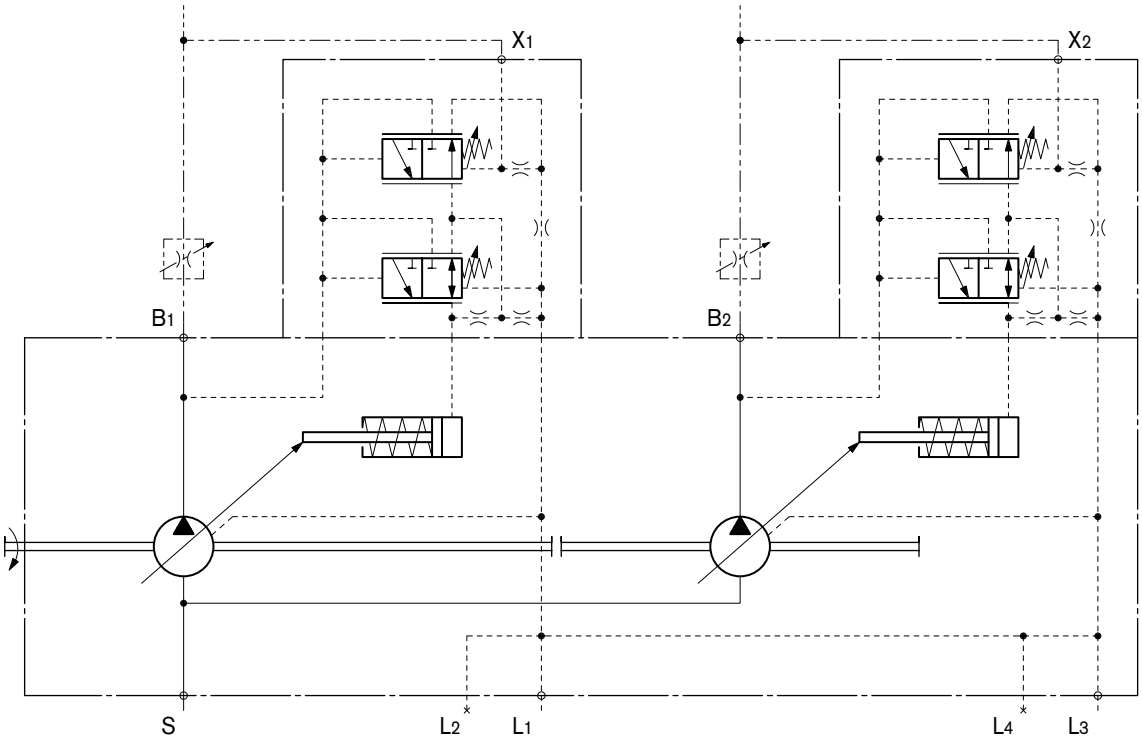
[1]) The values are quoted for an absolute pressure ($p_{abs}$) of 1 bar at suction port S and mineral operating fluid.
[2]) The values are quoted for an absolute pressure ($p_{abs}$) of at least 0.8 bar at suction port S and mineral operating fluid.
[3]) The values are quoted for $V_g < V_{g\,max}$ or increase of the input pressure $p_{abs}$ at suction port S.
[4]) $\Delta p = 250$ bar (long-term operation) or rather 315 bar (short term).

# Through Drive

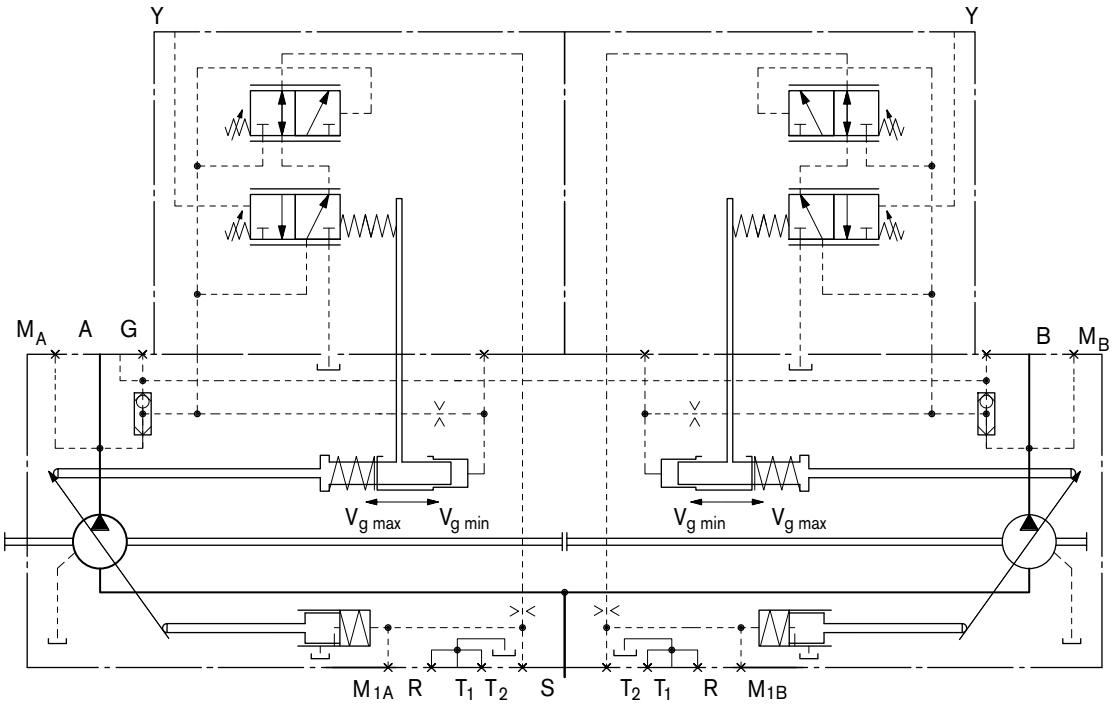
Please contact us.

# Control Devices

**Example circuit diagram Size 60: DFR**

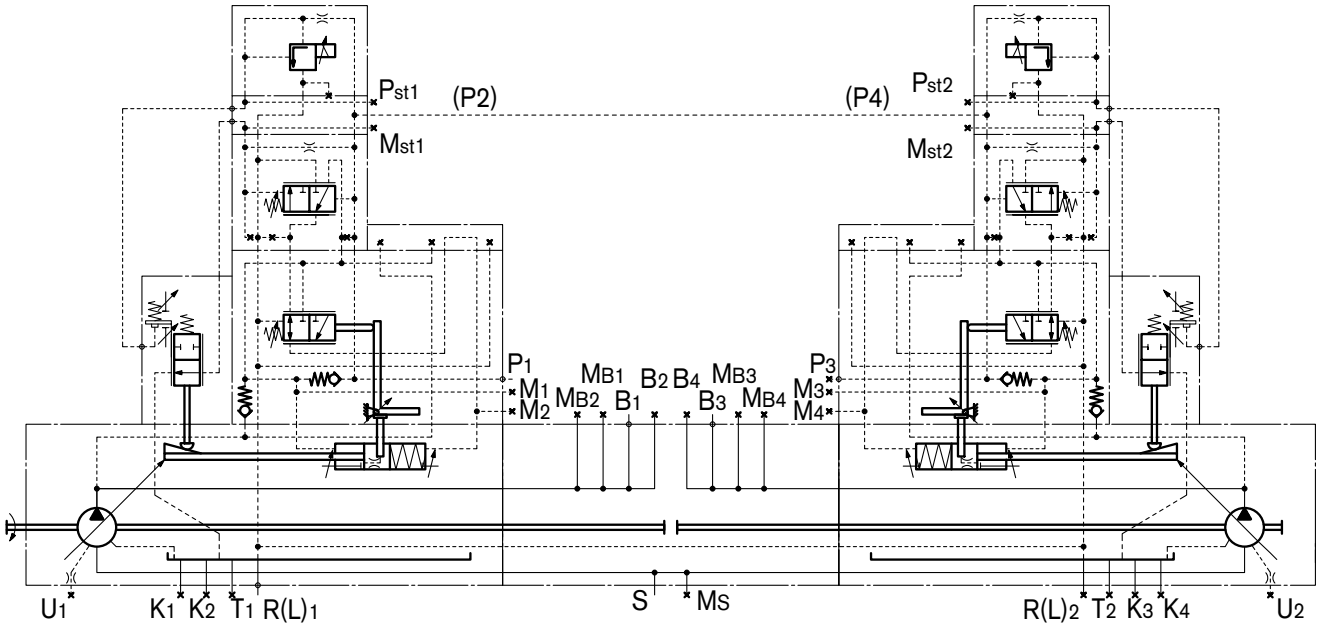



**Example circuit diagram Size 95...260: HD1D**



# Control Devices

**Example circuit diagram Size 520: LR2DN**




Further technical datas as soon as control devices see

for size 60 _____ RE 95703 (A10VO/53)

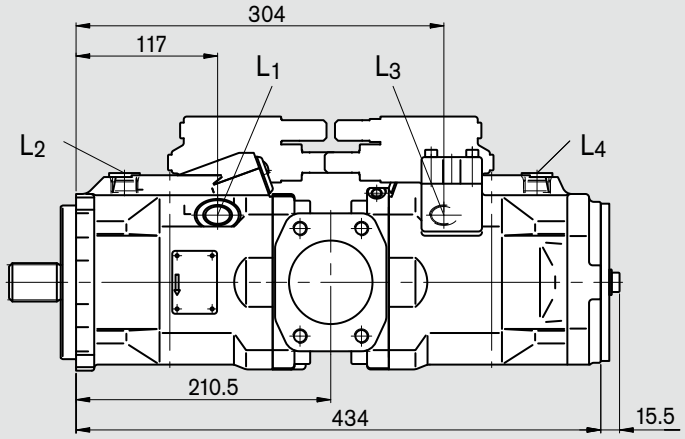
for sizes 95 ... 260 _____ RE 92500 (A11VO)

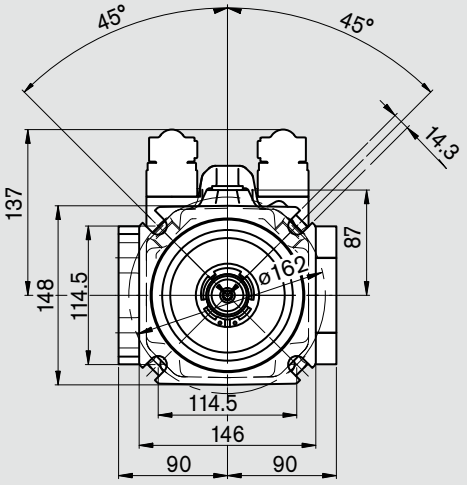
for size 520 _____ RE 92050 (A4VSO), RE 92060, RE 92064, RE 92076

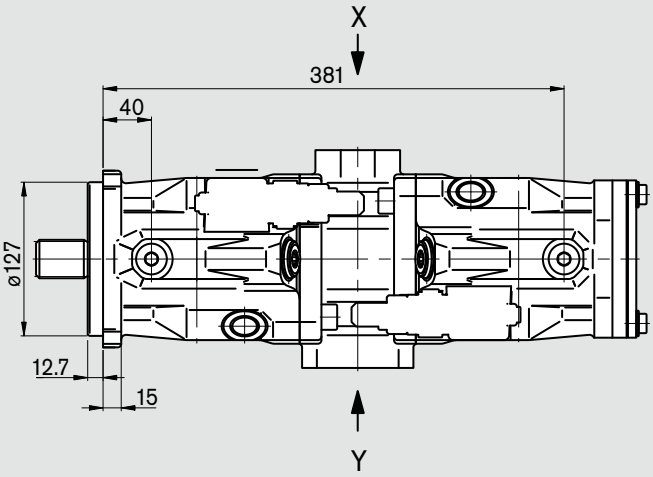
# Unit Dimensions, Size 60

Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

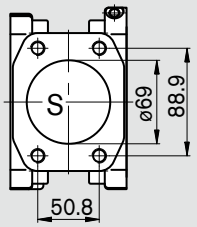
**For controller selection see RE 92703 (A10VO/53)**



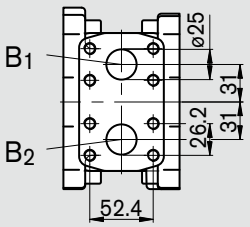




View Z




View Y

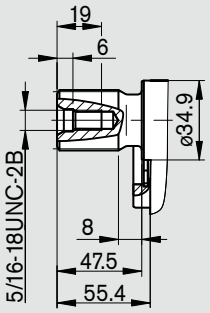


# Unit Dimensions, Size 60

Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

## Shaft end

**S** Splined shaft
1 1/4in 14T 12/24DP [1])
(SAE J744 – 32-4 (C))




## Ports

| | | | | |
|---|---|---|---|---|
| $B_1$, $B_2$ | Service ports (High pressure series) | SAE J518 | 1in | |
| | Fastening thread | DIN 13 | M10x1,5; 17 deep [2]) | |
| S | Suction port | SAE J518 | 2 1/2 in | |
| | Fastening thread | DIN 13 | M12x1,75; 20 deep [2]) | |
| $L_{1,2,3,4}$ | Case drain | DIN 3852 | 7/8-14UNF-2B | 240 Nm [2]) |

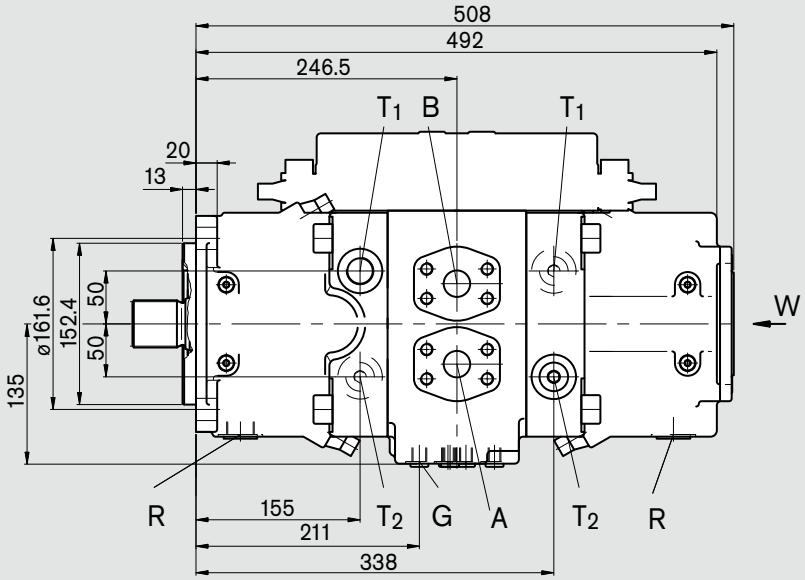
[1]) ANSI B92.1a-1976, pressure angle 30°, flat rood, side fit, tolerance class 5

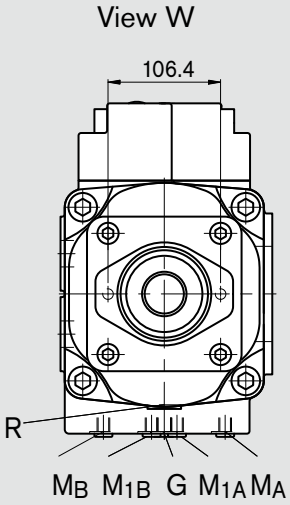
[2]) please observe the general notes for the max. tightening torques on page 16

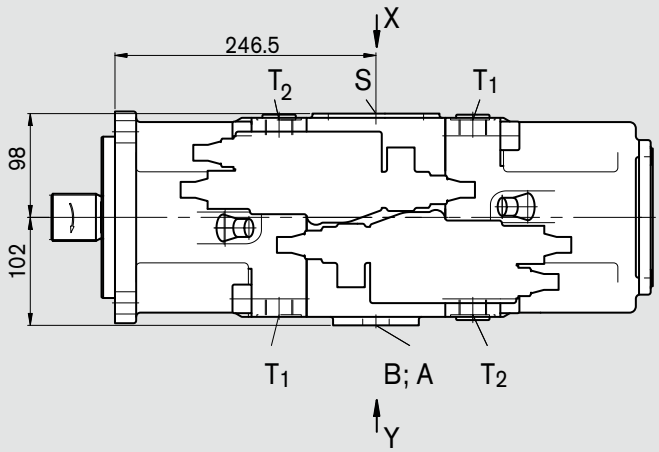
# Unit Dimensions, Size 95

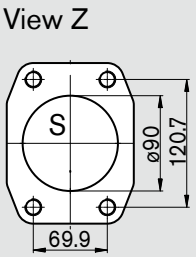
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

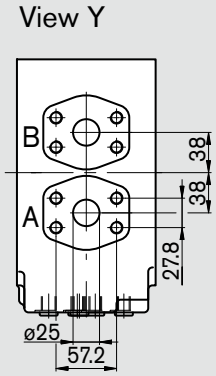
**For controller selection see RE92500 (A11VO)**



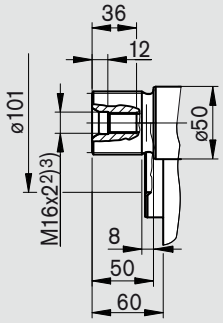



# Unit Dimensions, Size 95

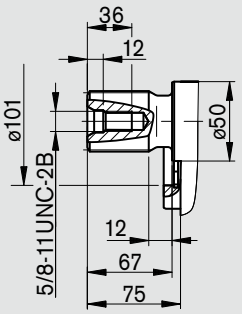
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

## Shaft ends

**Z** Splined shaft DIN 5480
W45x2x30x21x9g




**S** Splined shaft
1 3/4in 13T 8/16DP [1)]
(SAE J744 – 44-4 (D))




## Ports

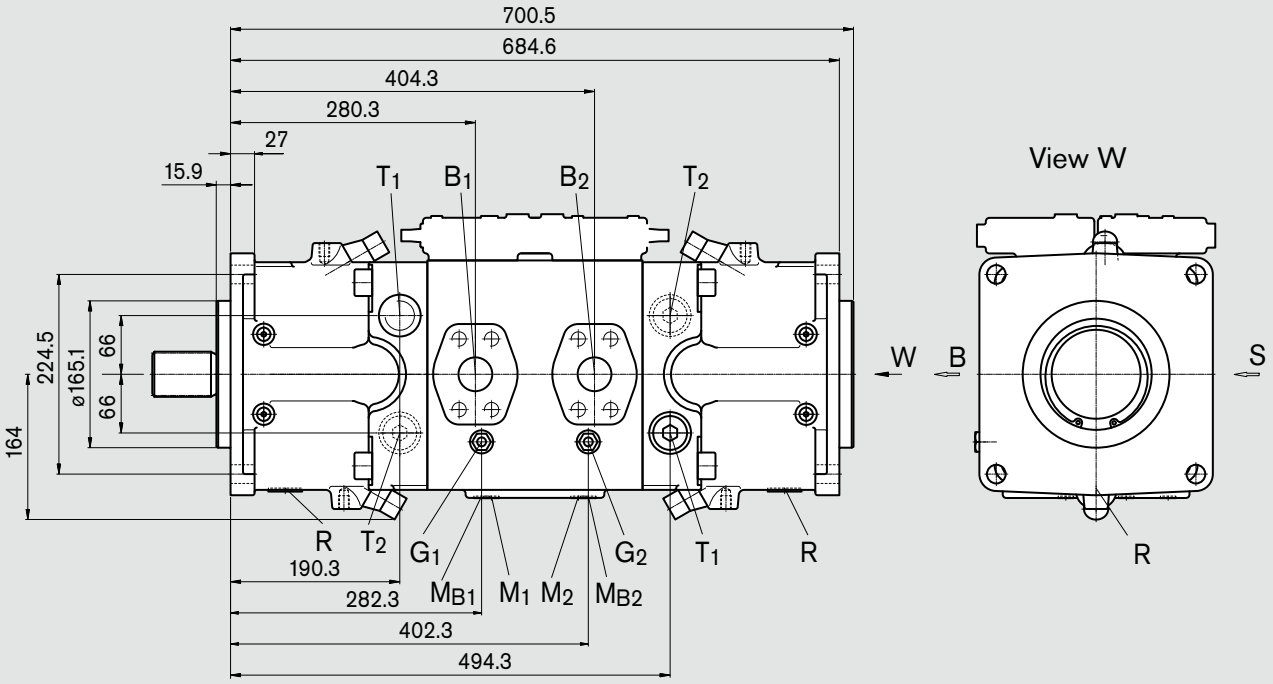
| | | | | |
|---|---|---|---|---|
| A, B | Service ports (High pressure series) | SAE J518 | 1in | |
| | Fastening threads | DIN 13 | M12x1,75; 17 deep [3)] | |
| S | Suction port (standard series) | SAE J518 | 3 1/2 in | |
| | Fastening threads | DIN 13 | M16x2; 24 deep [3)] | |
| $T_1$, $T_2$ | Case drain | DIN3852 | M26x1,5; 14 deep | 230 Nm [3)] |
| $M_A$, $M_B$ | Gauge point positioning chamber | DIN3852 | M12x1,5; 12 deep | 50 Nm [3)] |
| $M_{A1}$, $M_{B1}$ | Gauge point for service port | DIN3852 | M12x1,5; 12 deep | 50 Nm [3)] |
| R | Air bleed, drain port | DIN3852 | M26x1,5; 14 deep | 230 Nm [3)] |
| G | Control pressure port (controller) [4)] | DIN3852 | M14x1,5; 12 deep | 80 Nm [3)] |

[1)] ANSI B92.1a-1976, pressure angle 30°, flat rood, side fit, tolerance class 5
[2)] Center bore according to DIN 332 (thread according to DIN13)
[3)] please observe the general notes for the max. tightening torques on page 16
[4)] At design with stroke limiter (H..., U2), HD and EP with fitting GE10-PLM (in other case is port G plugged)

# Unit Dimensions, Size 190 (with impeller)

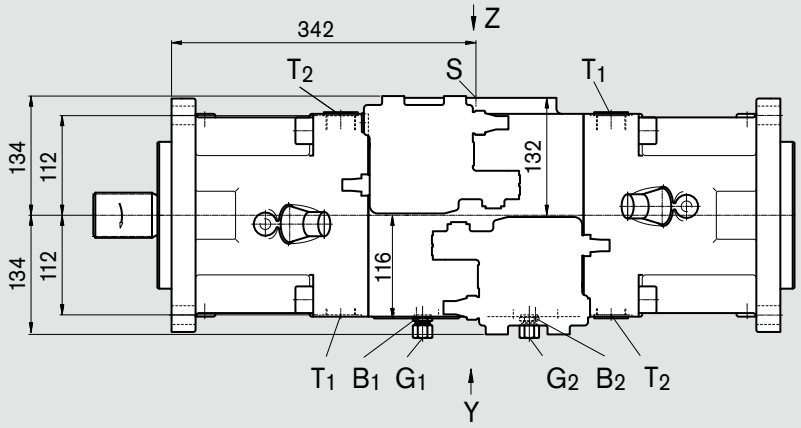
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

**For controller selection see RE92500 (A11VO)**

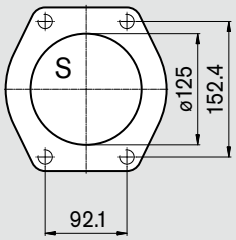



View W

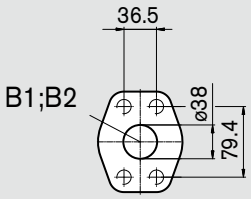



View Z




View Y

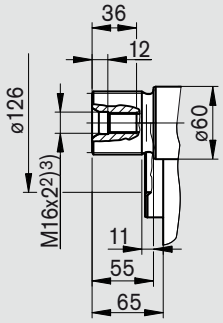


# Unit Dimensions, Size 190 (with impeller)

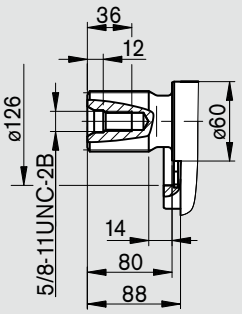
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

## Shaft ends

**Z** Splined shaft DIN 5480
W50x2x30x24x9g




**T** Splined shaft
2in 15T 8/16DP 1)
(SAE J744 – 50-4 (F))




## Connections

| | | | | |
|---|---|---|---|---|
| $B_1$, $B_2$ | Service ports (High pressure series) | SAE J518 | 1 1/2 in | |
| | Fastening threads | DIN 13 | M16x2; 21 deep | |
| S | Suction port (standard series) | SAE J518 | 5 in | |
| | Fastening threads | DIN 13 | M16x2; 23 deep | |
| $T_1$, $T_2$ | Case drain | DIN3852 | M33x2; 18 deep | 540 Nm 4) |
| $M_1$, $M_2$ | Gauge point positioning chamber | DIN3852 | M12x1,5; 12 deep | 50 Nm 4) |
| $M_{B1}$, $M_{B2}$ | Gauge point for service port | DIN3852 | M12x1,5; 12 deep | 50 Nm 4) |
| R | Air bleed, drain port | DIN3852 | M33x2; 16 deep | 540 Nm 4) |
| $G_1$, $G_2$ | Control pressure port (controller) 4) | DIN3852 | M14x1,5; 12 deep | 80 Nm 4) |

1) ANSI B92.1a-1976, pressure angle 30°, flat rood, side fit, tolerance class 5

2) Center bore according to DIN 332 (thread according to DIN13)

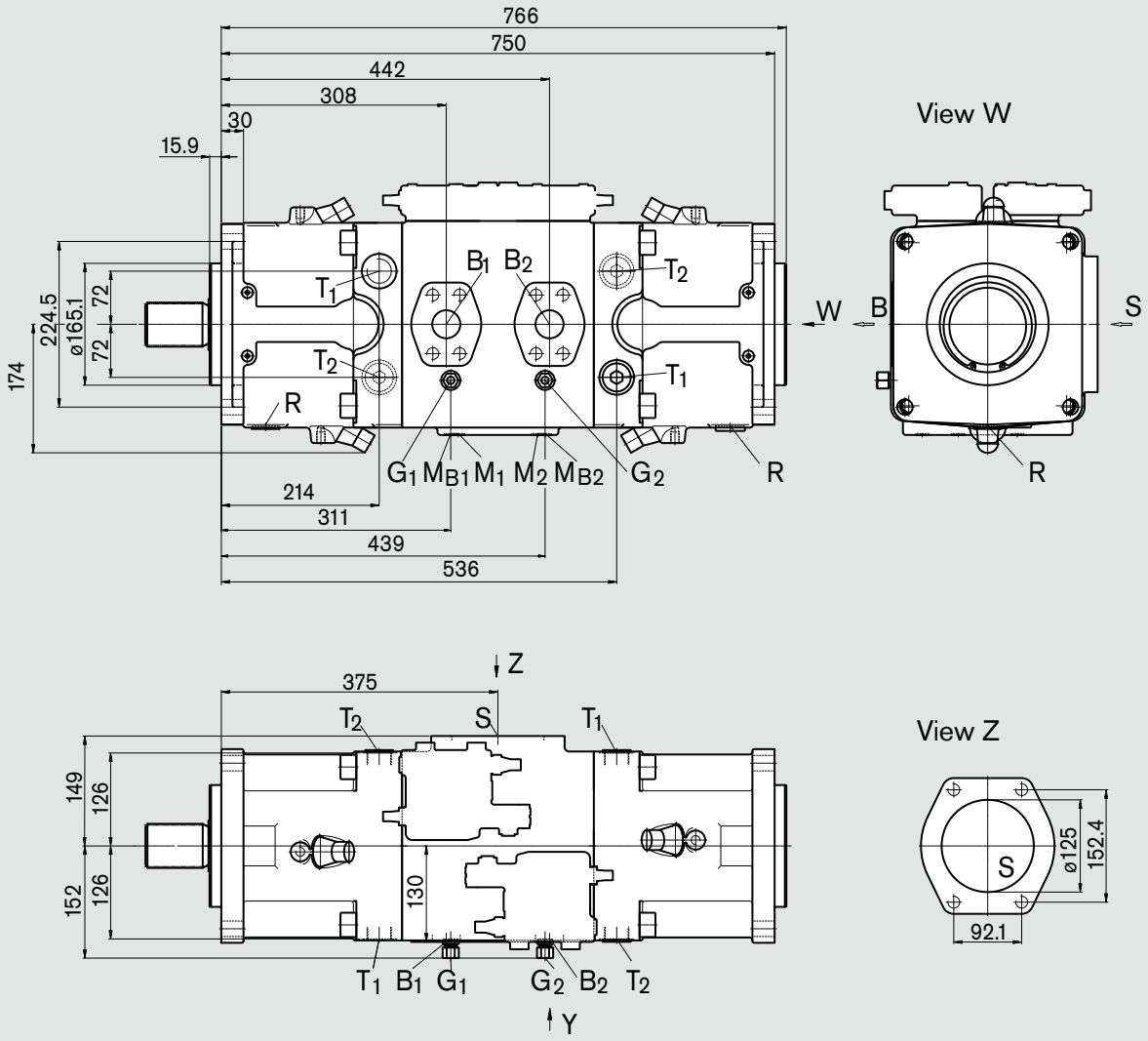
3) please observe the general notes for the max. tightening torques on page 16

4) At design with stroke limiter (H..., U2), HD and EP with fitting GE10-PLM (in other case is port G plugged)

# Unit Dimensions, Size 260 (with impeller)

Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

**For controller selection see RE92500 (A11VO)**

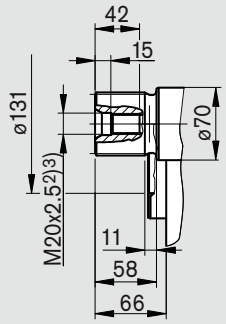


# Unit Dimensions, Size 260 (with impeller)

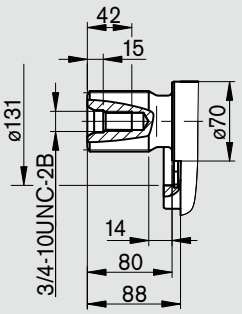
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

## Shaft ends

**Z** Splined shaft DIN 5480
W60x2x30x28x9g




**T** Splined shaft
2 1/4in 17T 8/16DP [1)]




## Connections

| | | | | |
|---|---|---|---|---|
| $B_1$, $B_2$ | Service ports (High pressure series) | SAE J518 | 1 1/2 in | |
| | Fastening threads | DIN 13 | M16x2; 21 deep [3)] | |
| S | Suction port (standard series) | SAE J518 | 5 in | |
| | Fastening threads | DIN 13 | M16x2; 23 deep [3)] | |
| $T_1$, $T_2$ | Case drain | DIN3852 | M33x2; 18 deep | 540 Nm [3)] |
| $M_1$, $M_2$ | Gauge point positioning chamber | DIN3852 | M12x1,5; 12 deep | 50 Nm [3)] |
| $M_{B1}$, $M_{B2}$ | Gauge point for service port | DIN3852 | M12x1,5; 12 deep | 50 Nm [3)] |
| R | Air bleed, drain port | DIN3852 | M33x2; 16 deep | 540 Nm [3)] |
| $G_1$, $G_2$ | Control pressure port (controller) [3)] | DIN3852 | M14x1,5; 12 deep | 80 Nm [3)] |

[1)] ANSI B92.1a-1976, pressure angle 30°, flat rood, side fit, tolerance class 5

[2)] Center bore according to DIN 332 (thread according to DIN13)

[3)] please observe the general notes for the max. tightening torques on page 16

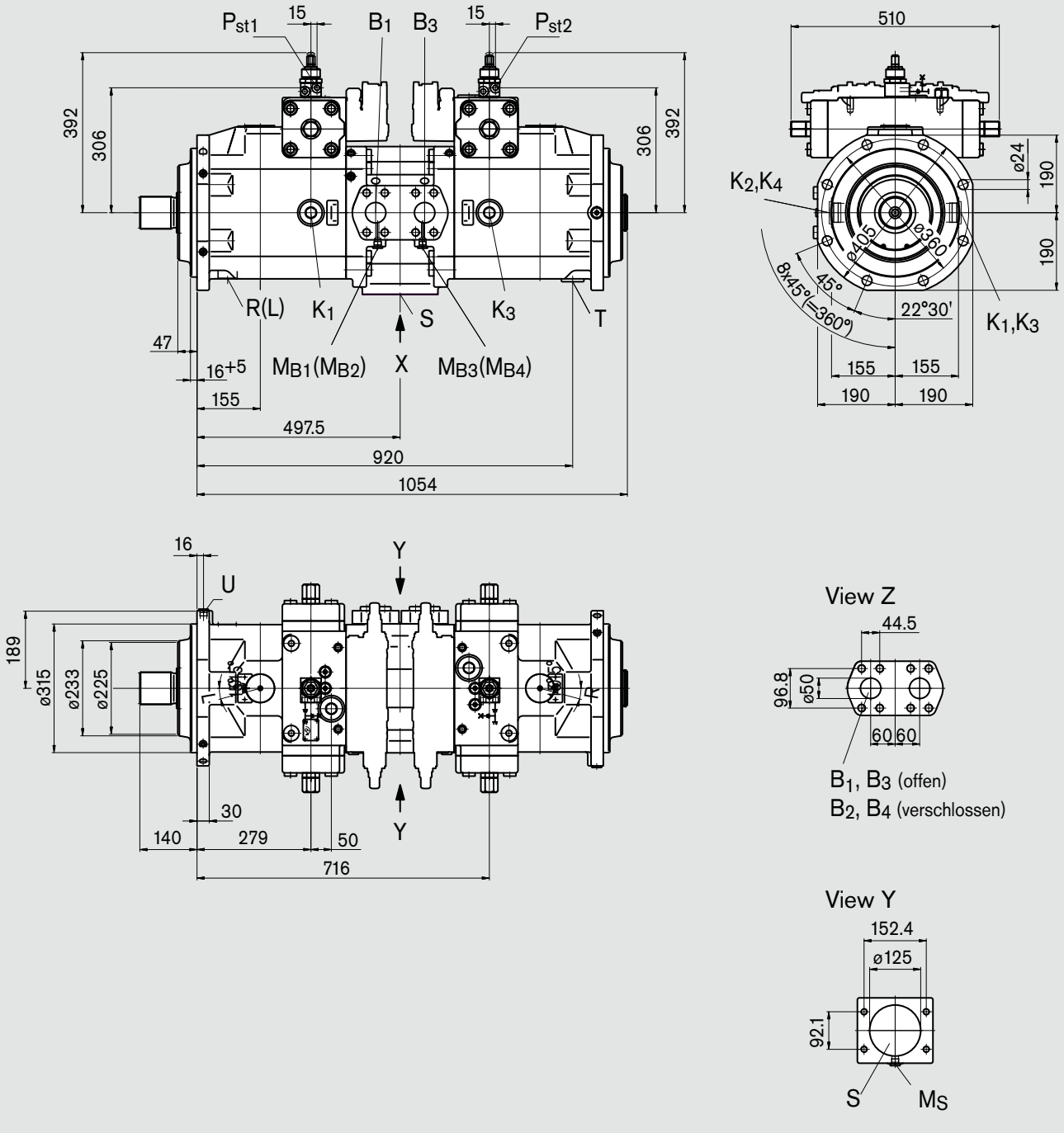
[4)] At design with stroke limiter (H..., U2), HD and EP with fitting GE10-PLM (in other case is port G plugged)

# Unit Dimensions, Size 520

Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

**For controller selection see RE92064 (A4VS)**

Picture for counter-clockwise

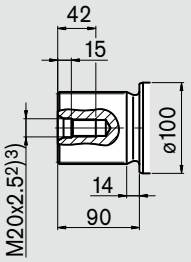


# Unit Dimensions, Size 520

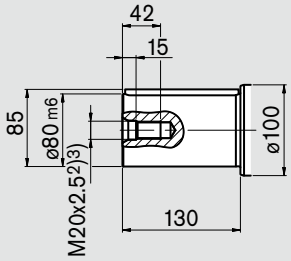
Before finalizing your design, please request a approved installation drawing.
Dimensions in mm

## Shaft ends

**Z** Splined shaft DIN 5480
W80x3x30x25x9g




**P** Parallel keyed shaft
DIN 6885




## Connections

| | | | | |
|---|---|---|---|---|
| $B_1$ - $B_4$ | Service line ports (High pressure series) | SAE J518 | 2 in | |
| | Fastening threads | DIN 13 | M20x2,5; 24 deep [3)] | |
| S | Suction port (standard series) | SAE J518 | 5 in | |
| | Fastening threads | DIN 13 | M16x2; 24 deep [3)] | |
| $K_1$ - $K_4$ | Flush ports | | M48x2; 22 deep | 960 Nm [3)] |
| $M_{B1}$, $M_{B4}$ | Gauge point for operating pressure | DIN3852 | M18x1,5; 12 deep | 140 Nm [3)] |
| $M_S$ | Gauge point for suction port | DIN3852 | M18x1,5; 12 deep | 140 Nm [3)] |
| $P_{st1}$, $P_{st2}$ | Pilot pressure port | | M14x1,5; 12 deep | 80 Nm [3)] |
| R (L) | Air bleed, drain port | DIN3852 | M48x2; 22 deep | 960 Nm [3)] |
| T | Case drain | DIN3852 | M48x2; 22 deep | 960 Nm [3)] |
| U | Flush port | DIN3852 | M18x1,5; 12 deep | 140 Nm [3)] |

[1)] ANSI B92.1a-1976, pressure angle 30°, flat rood, side fit, tolerance class 5
[2)] Center bore according to DIN 332 (thread according to DIN13)
[3)] please observe the general notes for the max. tightening torques on page 16
[4)] At design with stroke limiter (H1) with fitting GE10-PLM (in other case is port G plugged)

# General Notes

– The pump A20VO is designed to be used in open circuits.

– Project planning, assembly and commissioning of the pump require the invovement of trained personnel.

– The working and functional ports are only designed to accommadate hydraulic piping.

– There is a danger of burns from the pump and especially the solenoids during and shortly after operation. Suitable safety precautions, e.g. protective clothing plan.

– The characteristic curve may shift depending on the operating status (operating pressure, fluid temperature) of the pump.

– Tightening torques:
  - The tightening torques specified in this data sheet are maximum values and may not be exceeded (maximum value for screw thread). Manufacturer specifications for the max. permissible tightening torques of the used fittings must be observed!
  - For DIN 13 fastening screws we recommend checking the tightening torque individually according to VDI 2230 Edition 2003.

– The data and information contained herein must be adhered to.

Bosch Rexroth AG
Hydraulics
Product Segment Axial Piston Units
Elchingen Plant
Glockeraustrasse 2
89275 Elchingen, Germany
Phone +49 (0) 73 08 82-0
Facsimile +49 (0) 73 08 72 74
info.brm-ak@boschrexroth.de
www.boschrexroth.com/brm

Horb Plant
An den Kelterwiesen 14
72160 Horb, Germany
Phone +49 (0) 74 51 92-0
Facsimile +49 (0) 74 51 82 21