RE 91 175/06.98

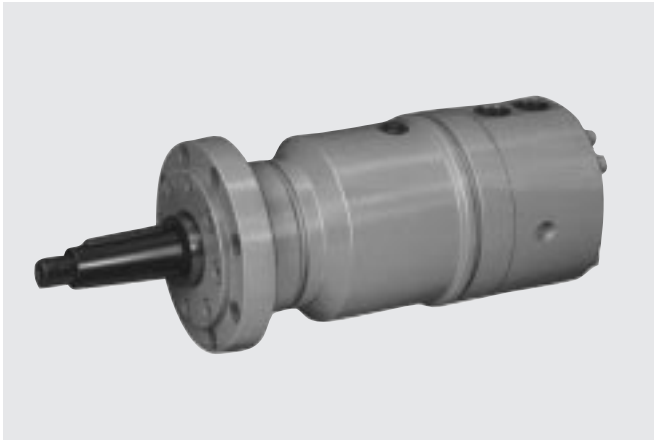
Replaces: 11.95

engineering
mannesmann
Rexroth

Fixed displacement motor A10FP

for open and closed circuit applications

Size 18
Baureihe 52
Nominal pressure 280 bar
Peak pressure 350 bar



A10FP

Contents

Features

- Fixed displacement motor, axial piston in swashplate design for hydrostatic transmissions in open and closed circuit applications.
- Output speed directly proportional to the inlet flow rate and inversely proportional to the motor displacement.
- Output torque increases with the pressure gradient between high and low-pressure sides.
- For mobile and stationary use.
- Compact, slim design.
- Long service life.
- High output speed.
- High permissible axial and radial forces on the output shaft.
- Tried-and-tested A10 power unit technology.
- Good power-to-weight ratio.
- Optionally prepared for speed monitoring.

- Further information:
  Fixed displacement motor A10FM/E RE 91 172
  Size 23 - 63

Brueninghaus
Hydromatik

Ordering code / standard range

A10F	P	18	/	5	2	W	–	S	C	S		

Hydraulic fluid

Mineral oil (without abbreviation)	

Axial piston pump

Swashplate design, fixed displacement, nominal press. 280 bar, peak press. 350 bar	**A10F**

Operating mode

Motor preferably for shipbuilding (propeller motor)	**P**

Size

≙ Motor displacement V_g in cm^3	**18**

Series

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Direction of rotation

Viewing onto shaft end	bi-directional	**W**

Seals

FPM (fluororubber to DIN ISO 1629) with FPM rotary shaft seals, Teflon-coated	**S**

Shaft end

Tapered with threaded bolt, feather key (K = 1:10)	**C**

Mounting flange

Flange for propeller installation	**S**

Ports for service lines

Ports A and B: at side (same side), metric thread	**16**
Ports A and B: at rear, SAE thread UNF	**64**

Speed monitoring

Without speed monitoring (no code)	
Prepared for speed monitoring	**D**

Technical data

Hydraulic fluid

Please refer to our catalogue sheets RE 90220 (mineral oil) and RE 90221 (environmentally friendly hydraulic fluids) for detailed information on selecting hydraulic fluids and on service conditions before the project planning stage.

Operation with environmentally friendly hydraulic fluids may result in modifications to the technical specifications; please consult us if necessary (the hydraulic fluid used must be clearly stated in the order).

Service viscosity range

We recommend selecting the service viscosity (at operating temperature) in the range of

ν_{opt} = opt. service viscosity 16...36 mm²/s

for optimum efficiency and useful life, referred to the circulation temperature (closed circuit).

Limiting viscosity range

Service limits are set at the following values:

ν_{min} = 10 mm²/s

briefly at max. permissible leakage oil temperature of t_{max} = 90°C.

ν_{max} = 1000 mm²/s

briefly on cold start (t_{min} = -25°C).

Temperature range (see selection chart)

t_{min} = -25°C

t_{max} = 90°C

Comment on selecting hydraulic fluid

The service temperature in the circuit (closed circuit) must be known as a function of the ambient temperature in order to choose the correct hydraulic fluid.

The hydraulic fluid must be selected in such a way that service viscosity lies within the optimum range (ν_{opt}) for the operating temperature span, see shaded area in the chart. We recommend selecting the next higher viscosity class in each case.

Example: A service temperature of 60 °C is established in the circuit at an ambient temperature of X °C. Given the optimum service viscosity range (ν_{opt}; shaded area), this will require viscosity classes VG 46 or VG 68; class to select: VG 68.

Note: The leakage oil temperature depends on the pressure and speed and is always higher than the temperature in circulation. However, temperature must not exceed 90 °C anywhere in the system.

Please contact us if it is not possible to meet the above conditions due to extreme service parameters or high ambient temperature.

Hydraulic fluid filtering

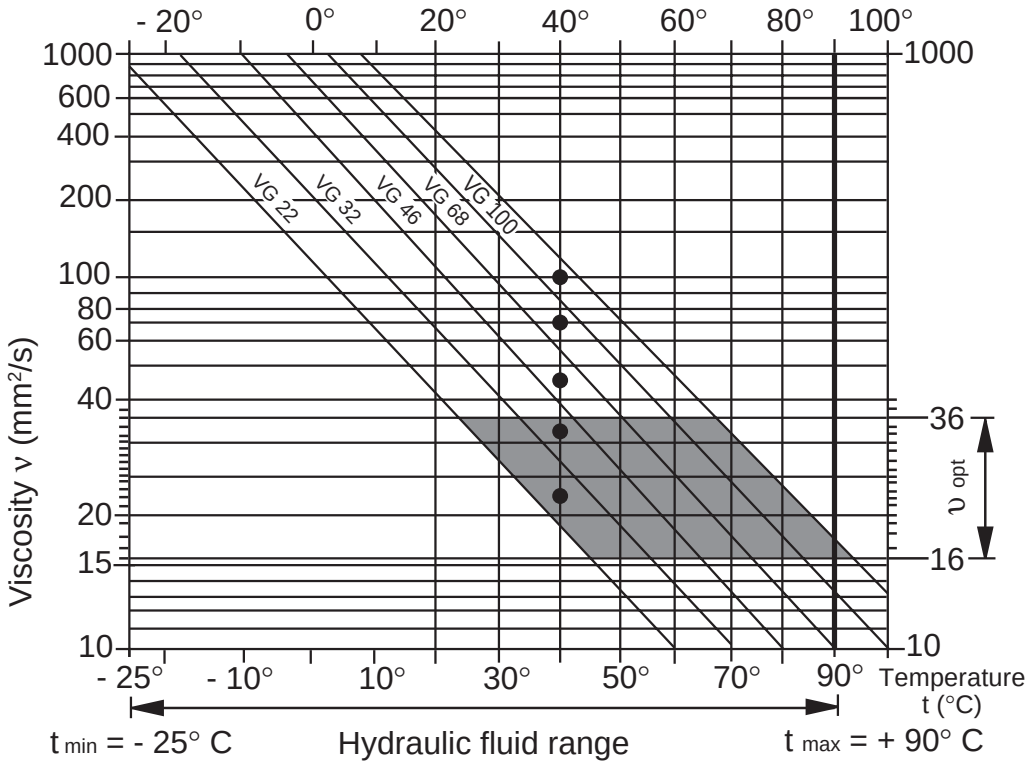
To ensure operational reliability, the service fluid must conform to at least purity class

9 to NAS 1638

18/15 to ISO/DIS 4406.

Please consult the manufacturer if the above classes cannot be maintained.

Selection chart



Technical data

Service pressure range

Pressure at port A or B
Nominal pressure p_N ____ 280 bar
Peak pressure p_{max} ____ 350 bar
(pressures to DIN 24312)

Leakage fluid pressure

Maximum permissible leakage fluid pressure at ports L and L_1
$p_{abs\ max}$ ____ 2 bar abs.

Installed position

Any. The motor housing must be filled with hydraulic fluid when starting up and during operation. The leakage fluid line must be routed so that the housing is not drained when the motor stops, i.e. the end of the line must enter the tank below the minimum oil level.

Direction of rotation

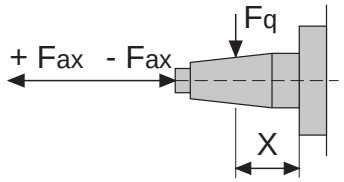
Pressure in A = Right-hand rotation
Pressure in B = Left-hand rotation

Table of values (theoretical values, ignoring η_{mh} and η_v: values rounded)

Size					18
Motor displacement			$V_{g\ max}$	cm^3	18
Max. speed			n_{max}	rpm	4200
Max. inlet flow rate	at n_{max}		$q_{v\ max}$	L/min	75.6
Max. power	at n_{max}	Δp = 280 bar	P_{max}	kW	35.3
Max. torque	at $V_{g\ max}$	Δp = 280 bar	T_{max}	Nm	80
Mass moment of inertia (about the output shaft)			J	kgm^2	0.00093
Capacity, approx.				L	0.2
Weight, approx.			m	kg	9
Permissible load on output shaft, max. perm. axial force			$F_{ax\ max}$	N	2300
Max. perm. lateral force [1])			$F_{q\ max}$	N	350
Force applied at a distance of			X	mm	40
Max. water depth when used as propeller motor [2])				m	300

[1]) Please contact us if higher lateral forces are encountered

[2]) Please contact us if greater depths are encountered



Calculating size

Inlet flow rate $q_v = \frac{V_g \cdot n}{1000 \cdot \eta_v}$ in L/min

Torque $T = \frac{1{,}59 \cdot V_g \cdot \Delta p \cdot \eta_{mh}}{100}$ in Nm

Output power $P = \frac{T \cdot n}{9549} = \frac{q_v \cdot \Delta p \cdot \eta_t}{600}$ in kW

Output speed $n = \frac{q_v \cdot 1000 \cdot \eta_v}{V_g}$ in rpm

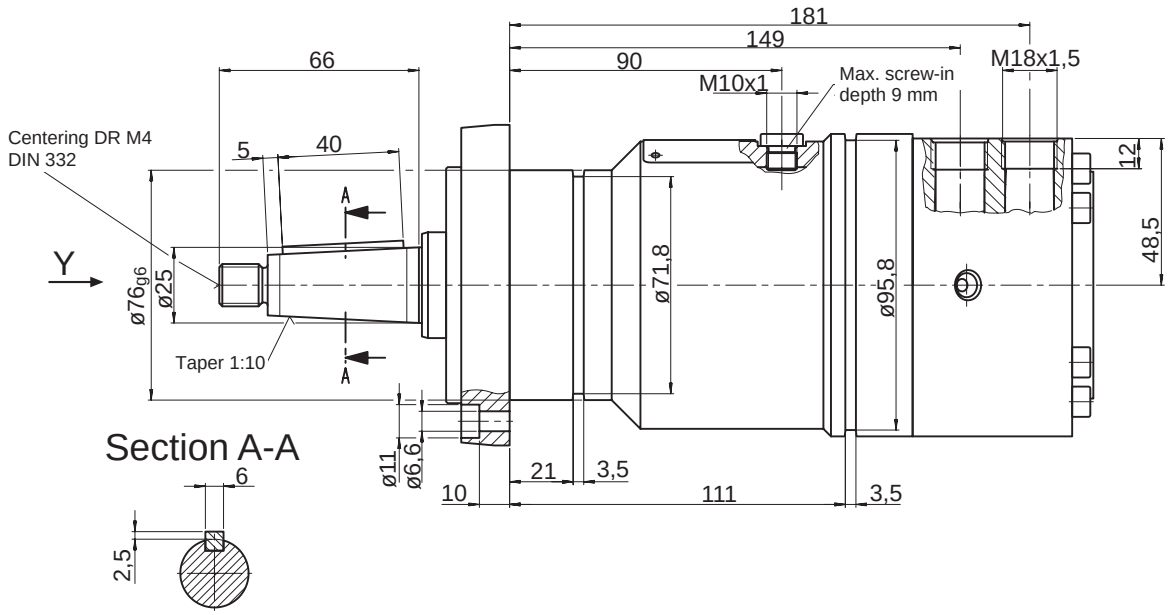
V_g = geometric motor displacement per revolution in cm^3
Δp = pressure differential in bar
n = speed in rpm
η_v = volumetric efficiency
η_{mh} = mechanical-hydraulic efficiency
η_t = total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

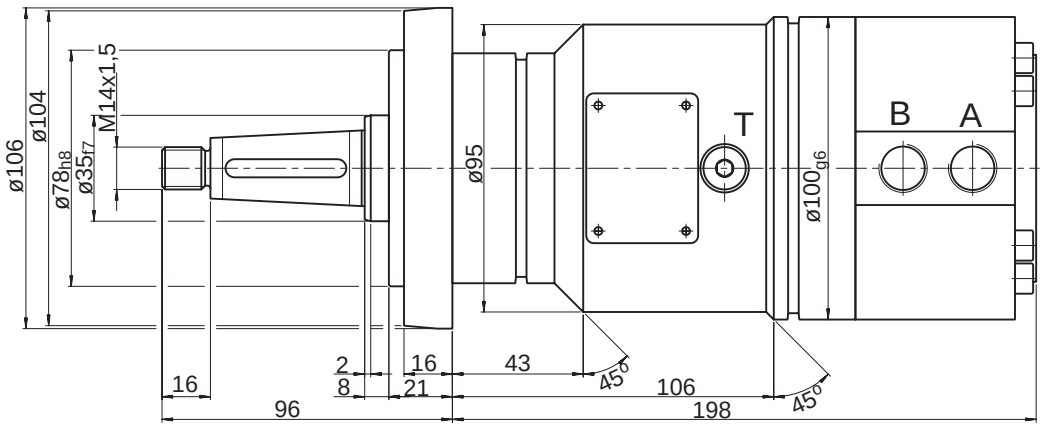
Unit dimensions

Before finalising your design, please request certified assembly drawing.

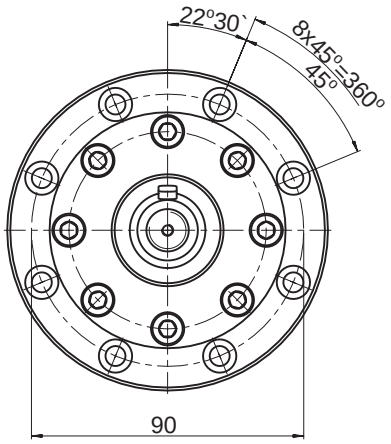
A10FP 18/52W–SCS16

Subplate 16





View Y



Ports

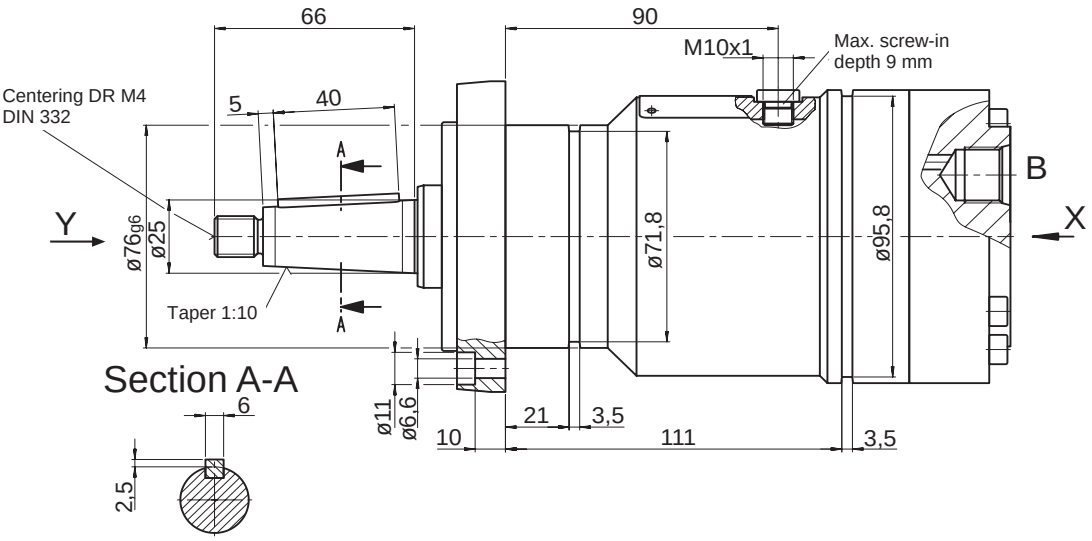
A, B	Pressure ports M18 x 1.5
T	Oil filler port / venting port M10x1, plugged

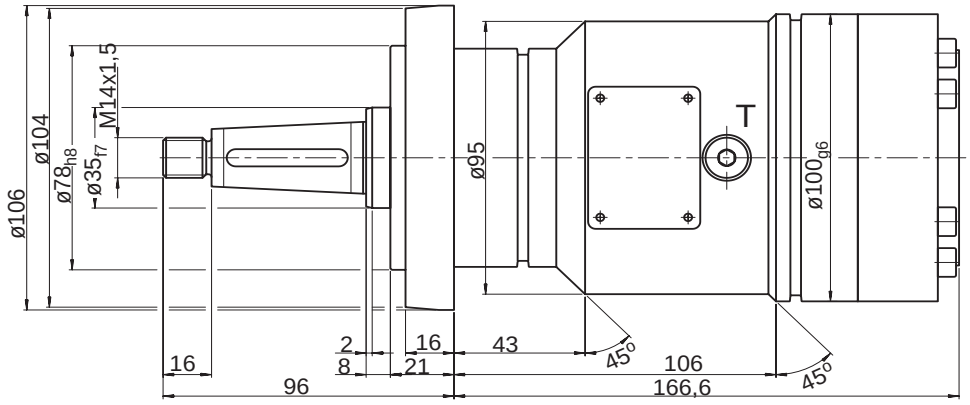
Unit dimensions

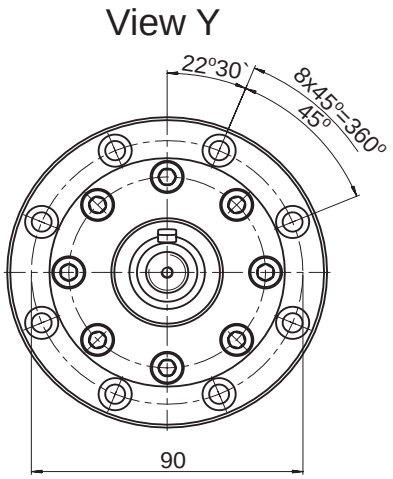
Before finalising your design, please request certified assembly drawing.

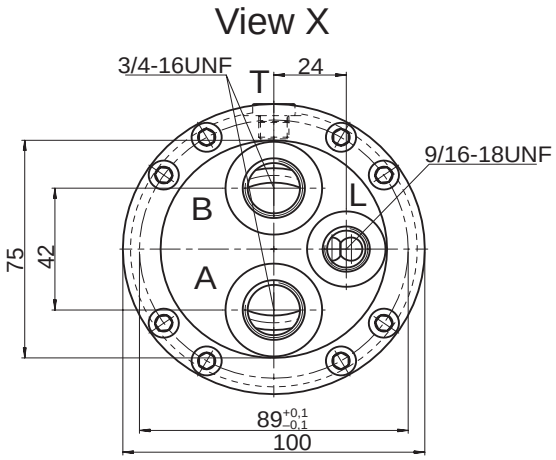
A10FP 18/52W–SCS64

Subplate 64





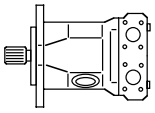




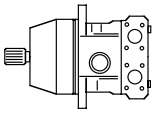
Ports

A, B	Pressure ports 3/4-16UNF
L	Leakage oil port 9/16-18UNF
T	Oil filler port / venting port M10x1, plugged

Other motors in series A10



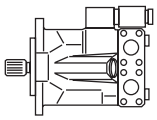
Fixed displacement motor
A10FM
Series 52



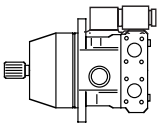
Fixed displacement plug-in motor
A10FE
Series 52

RE 91172

Size:
23 cm³ 28 cm³ 37 cm³ 45 cm³ 63 cm³



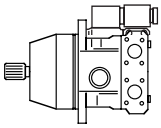
Dual displacement motor
A10VM
Series 52



Dual displacement plug-in motor
A10VE
Series 52

RE 91703
(in preparation)

Size:
28 cm³ 45 cm³ 60 cm³

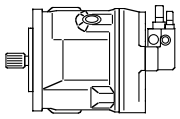


Dual displacement motor
A10VEC
Series 52

RE 91710

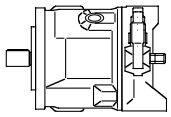
Size:
45 cm³ 60 cm³ 80 cm³

The A10 series of pumps



RE 92701

Variable displacement pump
A10VO
Series 31



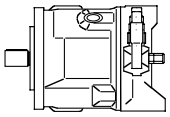
RE 92711

Variable displacement pump
A10VSO
Series 31

Size:
28 cm³ 45 cm³ 71 cm³ 100 cm³ 140 cm³

Control devices:

DG	Two-point control, directly controlled
DR	Pressure controller
DFR	Pressure and flow controller
DFLR	Pressure, flow and power controller
DFSR	Pressure, flow and total power controller
FHD	Flow controller, dependent on pilot pressure, with pressure control
FE1	Flow controller, electronic
DFE1	Pressure and flow controller, electronic
DS	Speed regulation with secondary control (RE 92715)



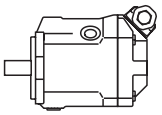
RE 92712

Variable displacement pump
A10VSO
Series 31

Size:
18 cm³

Control devices:

DR	Pressure controller
DFR	Pressure and flow controller
DFR1	Pressure and flow controller, channel X plugged
DFE1	Pressure and flow controller, electronic



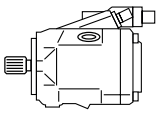
RE 92713

Variable displacement pump
A10VSO
Series 52

Size:
10 cm³

Control devices:

DR	Pressure controller
DRG	Pressure controller, remote-controlled
DFR1	Pressure and flow controller, channel X plugged



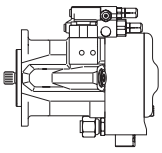
RE 92703

Variable displacement pump
A10VO
Series 52

Size:
28 cm³ 45 cm³ 60 cm³

Control devices:

DR	Pressure controller
DFR	Pressure and flow controller



RE 92730

Compact unit
A10CO
Series 52

Size:
45 cm³

Control devices:

DR	Pressure controller
DFR	Pressure and flow controller

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