

**MANNESMANN
REXROTH****Compact Unit A10CO**

52-series, axial piston in swashplate design

**RE
92730/01.98**

Brueninghaus Hydromatik

NG 45

Nominal pressure 250 bar Peak pressure 315 bar



The A10VO compact unit was designed specifically for mobile applications where it is necessary to boost the A10-inlet with a full flow boost pump, i.e. hydraulic systems for agricultural tractors, running on oil from the transmission (common oil systems). This enables also an effective filtration in the A10-inlet line.

A boost pump with a some what larger displacement can provide extra oil for lubricating purposes.

- Central hydraulic unit for mounting to transmission p.t.o. in mobile applications
- Integrated boost pump
- A10VO main pump with controller
- Filter mounting capability
- Integrated pressure relief valves
- Reduced pipework
- Compact design
- Transmission lubrication port
- Measurement or monitoring ports
- Integrated case drain port inside pilot diameter



Compact unit A10CO, 52-series

Type key

A10C	O	45		/ 52	- V	C		H00	2
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Hydraulic fluid

Mineral oil (without prefix)

Axial-piston pump

Compact unit in swashplate design, adjustable
Nominal pressure 250 bar, peak pressure 315 bar **A10C**

Operating mode

Pump, open-circuit **O**

Size

△ Displacement volume $V_{g\ max}$ (cm³) **45**

Control options

Pressure controller	DR		DR	} see RE 92703
Pressure controller, remote controlled	DRG		DRG	
Pressure and flow controller	DFR		DFR	
without connection from X to tank	DFR	1	DFR1	

Series

52

Direction of rotation

Viewing drive shaft	cw	R
	anti-cw	L

Seals

FPM (fluororubber to DIN ISO 1629) **V**

Shaft end

Spline shaft SAE, shortened	○	1"	S
Spline shaft SAE, shortened (higher through-drive torque)	○	1"	R
Spline shaft SAE, shortened	●	7/8"	U

Mounting flange

SAE 2-hole **C**

Port for service lines

Pressure port B } metric thread side ports Suction port S	07
Pressure port B } SAE on opposite sides, metric fixing thread Suction port S	12

Boost pump

with integrated boost pump **H00**

Valves

with integrated pressure relief valves **2**

Filtration

Filter installed in boost circuit	●	F
without filter, mounting option only	●	D

● = available
○ = in preparation

Compact unit A10CO, 52-series

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.

Service viscosity range

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

$$v_{\text{opt}} = \text{opt. opt. service viscosity } 16 \dots 36 \text{ mm}^2/\text{s}$$

for optimum efficiency and useful life, in relation to tank temperature (open circuit).

Limiting viscosity range

Service limits are set at the following values:

$$v_{\text{min}} = 10 \text{ mm}^2/\text{s}$$

briefly at max. permissible leakage oil temperature of 90 °C.

$$v_{\text{max}} = 1000 \text{ mm}^2/\text{s}$$

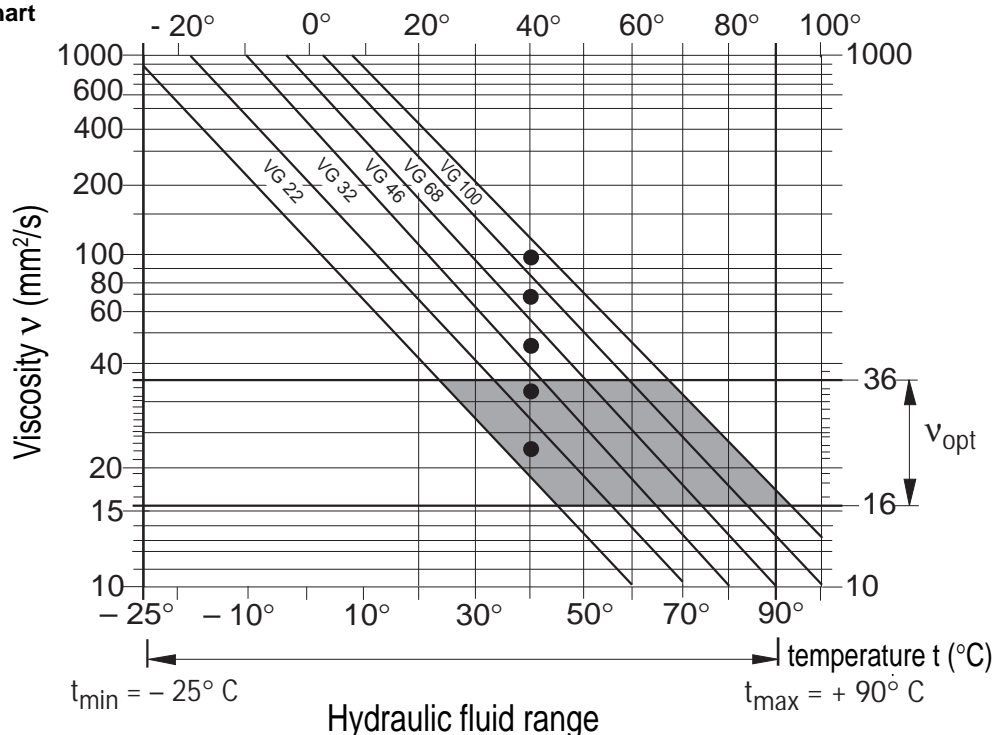
briefly on cold start.

Temperature range (see selection chart)

$$t_{\text{min}} = -25 \text{ °C}$$

$$t_{\text{max}} = +90 \text{ °C}$$

Selection chart



Comment on selecting hydraulic fluid

To select the correct hydraulic fluid it is necessary to know the operating temperature in the tank (open circuit) in relation to ambient temperature.

The hydraulic fluid must be selected in such a way that service viscosity lies within the optimum range (v_{opt}) for the operating temperature span, see shaded area in the chart.

We recommend selecting the next higher viscosity class in each case.

Example: An ambient temperature of X °C will produce an operating temperature in the tank of 60 °C. Given the optimum service viscosity range (v_{opt} ; shaded area), this will require viscosity classes VG 46 or VG 68; class to select: VG 68.

Note: The leakage oil temperature, affected by pressure and speed, is always higher than tank temperature. 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 at the axial piston pump

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

9 to NAS 1638

18/15 to ISO/DIS 4406.

Compact unit A10CO, 52-series

Technical specifications

Service pressure range, input

Absolute pressure at port S

$p_{abs \min}$ 0.8 bar
 $p_{abs \max}$ 5 bar

Service pressure range, output

Pressure at port B

Nominal pressure p_N 250 bar
 Peak pressure p_{\max} 315 bar
 (pressures to DIN 24312)

Direction of flow

S to B.

Leakage fluid pressure

Maximum permissible leakage fluid pressure (at port L, L_i):

$p_{L \max}$ 2 bar absolut
 Always given with end-face leakage oil bore allowing unrestricted drainage into transmission housing.

Pressure at lubrication oil port G:

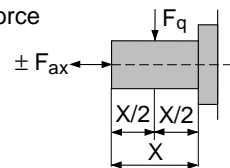
 $p_{abs \min} = 1 \text{ bar}$

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

Size			45
Displacement volume		$V_{g \max}$ cm ³	45
Max. speed *	at $V_{g \max}$	$n_{o \max}$ rpm	2750
Max. volumetric flow (delivery)	at $n_{o \max}$	$q_{Vo \max}$ L/min	123
Max. power ($\Delta p = 250 \text{ bar}$)	at $n_{o \max}$	$P_{o \max}$ kW	52
Max. torque ($\Delta p = 250 \text{ bar}$)	at $V_{g \max}$	T_{\max} Nm	181
Moment of inertia around drive axle		J kgm ²	0.0047
Fluid capacity		L	0.6
Mass (without fluid)		m kg	27.2
Permissible load on drive shaft:			
max. permissible axial force		$F_{ax \max}$ N	1500
max. permissible lateral force		$F_{q \max}$ N	1500

*intermittently 3000 rpm

Application of force



Calculating size

Volumetric flow $q_v = \frac{V_g \cdot n \cdot \eta_v}{1000}$ [L/min] V_g = geometric displacement volume [cm³] per revolution

Drive torque $T = \frac{1.59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}}$ [Nm] Δp = pressure differential [bar]
 n = speed [rpm]

Drive power $P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{T \cdot n}{9549} = \frac{q_v \cdot \Delta p}{600 \cdot \eta_t}$ [kW] η_v = volumetric efficiency
 η_{mh} = mechanical-hydraulic efficiency
 η_t = total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

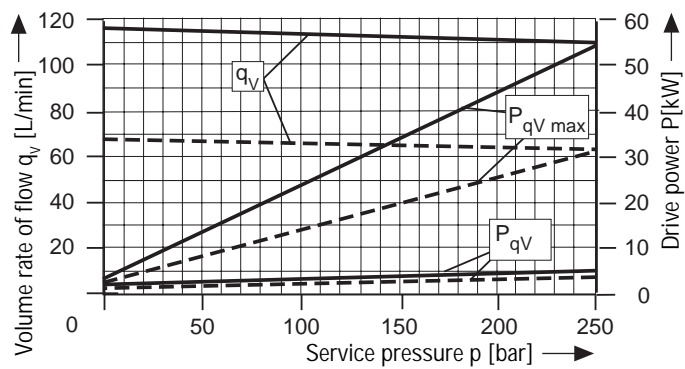
Compact unit A10CO, 52-series

Characteristic curves for pump with pressure controller DR

Drive power and delivery rate (volumetric flow)

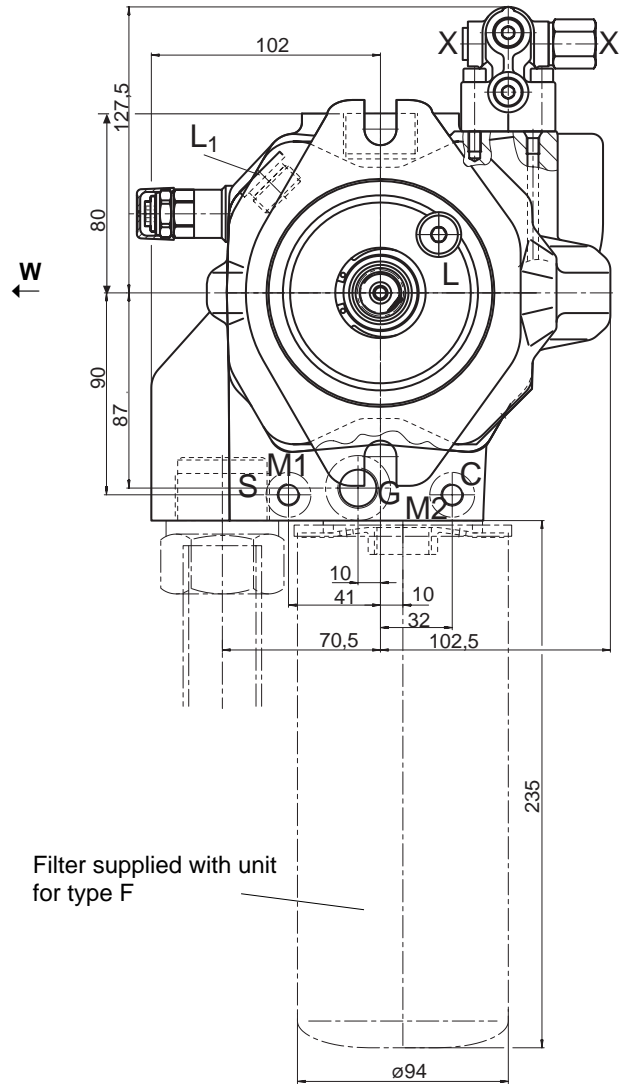
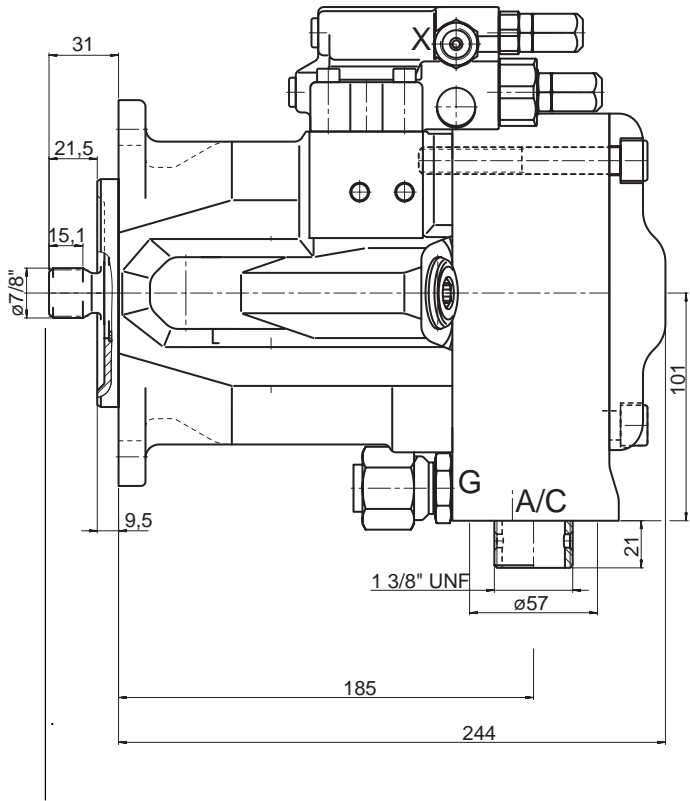
(service fluid: hydraulic oil ISO VG 46 DIN 51519, $t = 50\text{ }^{\circ}\text{C}$)

Size 45

- - - - $n = 1500\text{ rpm}$ — $n = 2600\text{ rpm}$ 

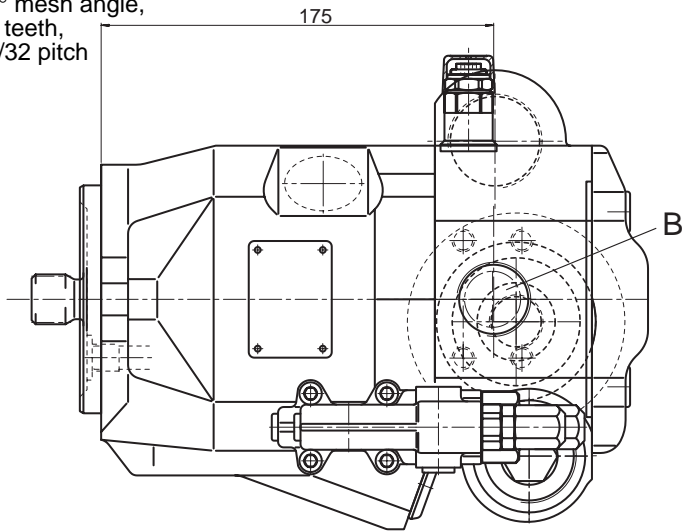
Unit dimensions size 45, clockwise direction of rotation

Type A10CO 45 DR
DFR
DFR1 /52 R -V U C 07 H00 2 D
DRG 12 F

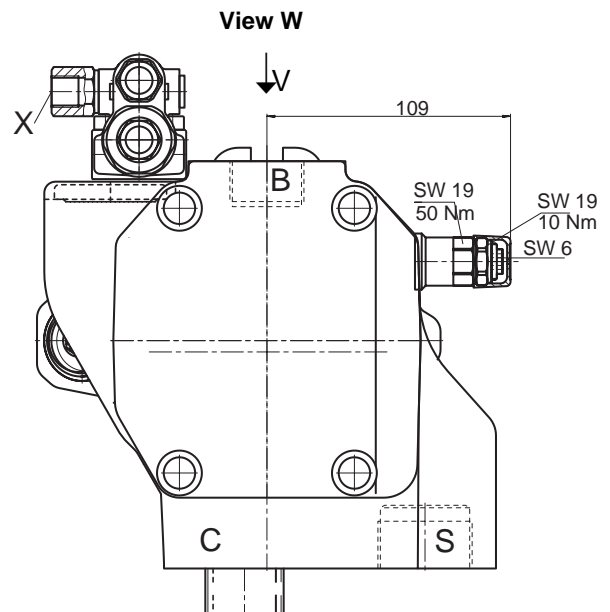
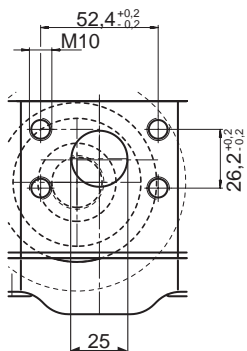


Shaft 22-4 (SAE B) shortened
SAE J744 OCT 83
30° mesh angle,
13 teeth,
16/32 pitch

Filter supplied with unit
for type F



View V
Pressure port B
model 12

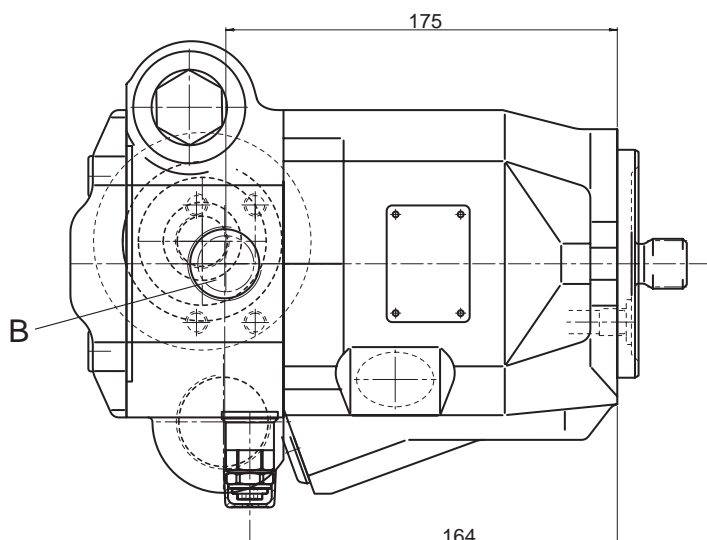
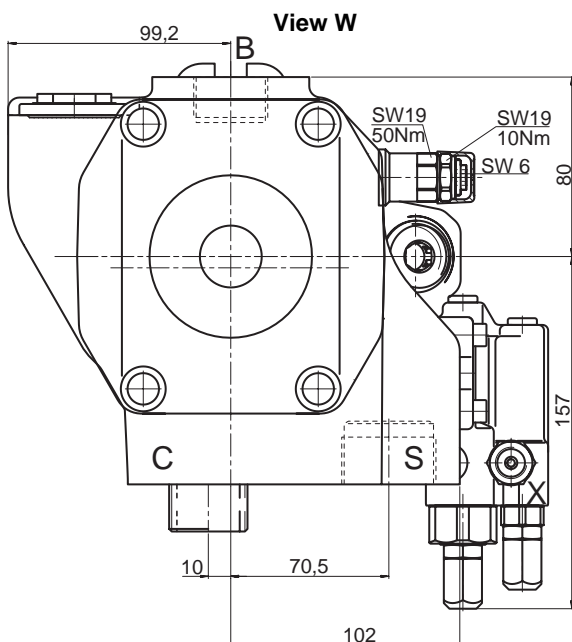
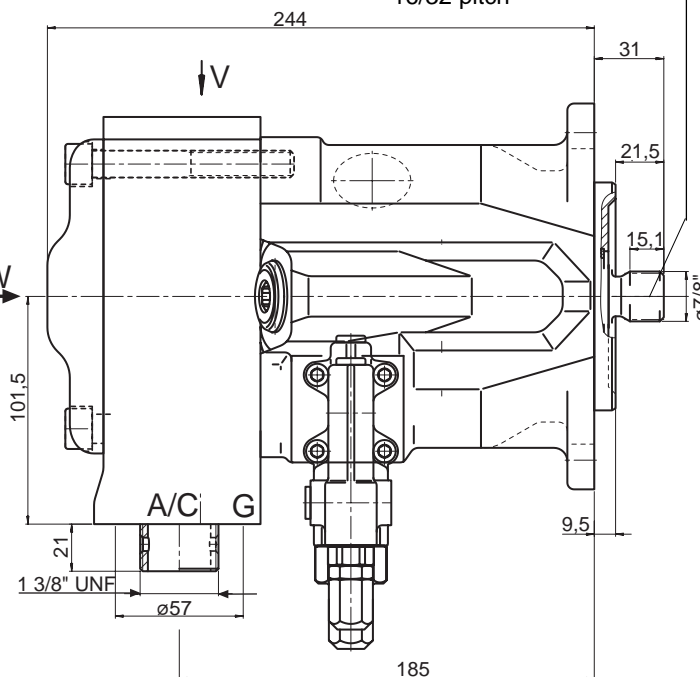
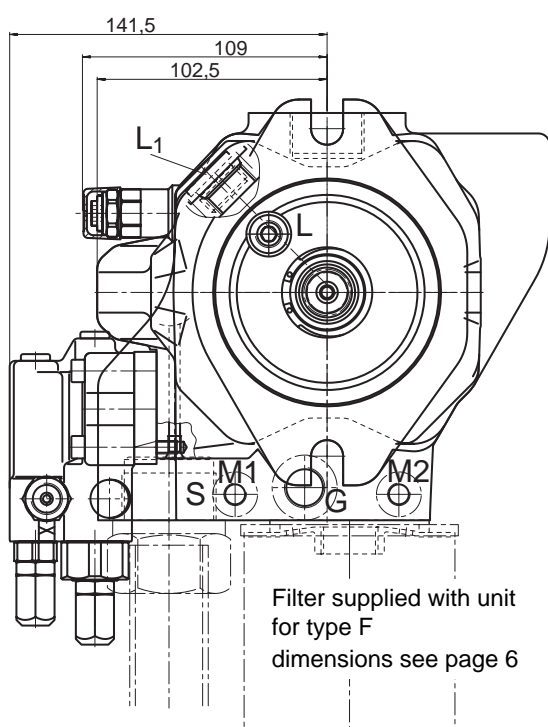


Ports see page 7

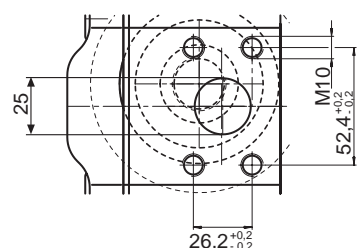
Unit dimensions size 45, anti-clockwise direction of rotation

Type A10CO 45 DR
DFR
DFR1 /52 L -V U C 07 H00 2 D
DRG 12 F

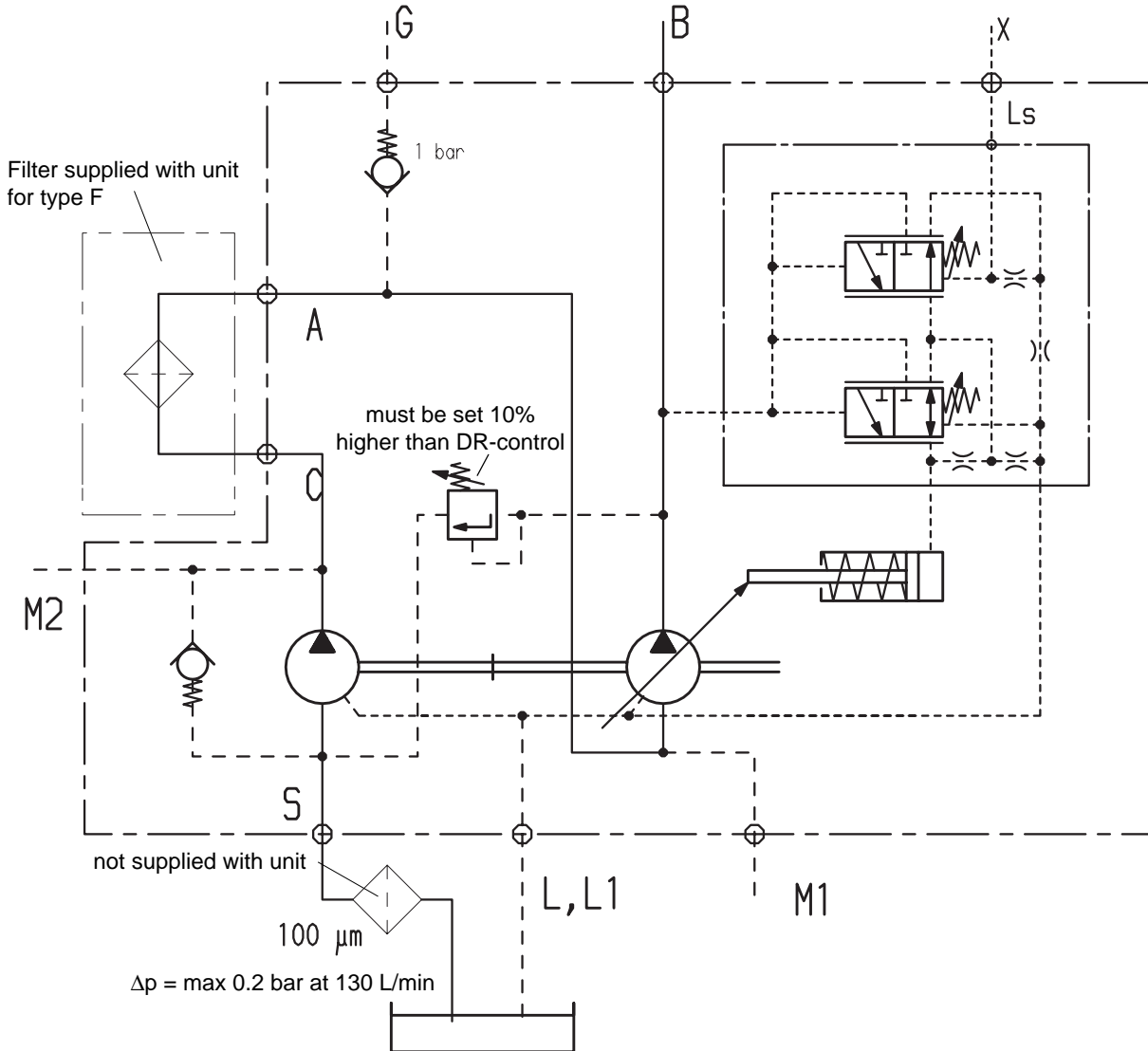
Shaft 22-4 (SAE B) shortened
SAE J744 OCT 83
30° mesh angle,
13 teeth,
16/32 pitch



View V
Pressure port B, model 12



Ports	Model 07	Model 12
B Pressure port	M33x2	SAE 1" (standard pressure)
S Suction port	M48x2	M48x2
A/C Filter port, feed pump to DIN 71457-A1,2	1 3/8" UNF-2B	1 3/8" UNF-2B
L Case drain port	M12x1,5 integrated	M12x1,5 integrated
L ₁ Case drain port	7/8-14UNF-2B	7/8-14UNF-2B
X Control pressure port	M14x1,5	M14x1,5
with pressure controller DR – X port closed		
G Transmission lubrication port	M18x1,5	M18x1,5
M ₁ , M ₂ Measurement ports	M10x1	M10x1

Circuit diagramType A10CO 45 DFR /52 X- V U C XX H00 2D
F**Ports**

B Pressure port

S Suction port

A/C Filter port, feed pump

L, L₁ Case drain ports

X Control pressure port

with pressure controller DR – X port closed

G Transmission lubrication port

M₁, M₂ Measurement ports