A10CO

Series 52 axial piston pump

Size 45,63	Nominal pressure 250 bar	Peak pressure 315 bar

Gelan Hydraulics

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

Type key

A10C	O	45		/	52		–	V		C		H00	2	

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 $V_{g\,max}$ (cm^3)	**45,63**

Control options

Pressure controller	DR			**DR**
Pressure controller, remote controlled	DRG			**DRG**
Pressure and flow controller	DFR			**DFR**
	DFR	1		**DFR1**

} see RE 92703

without connection from X to tank

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

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

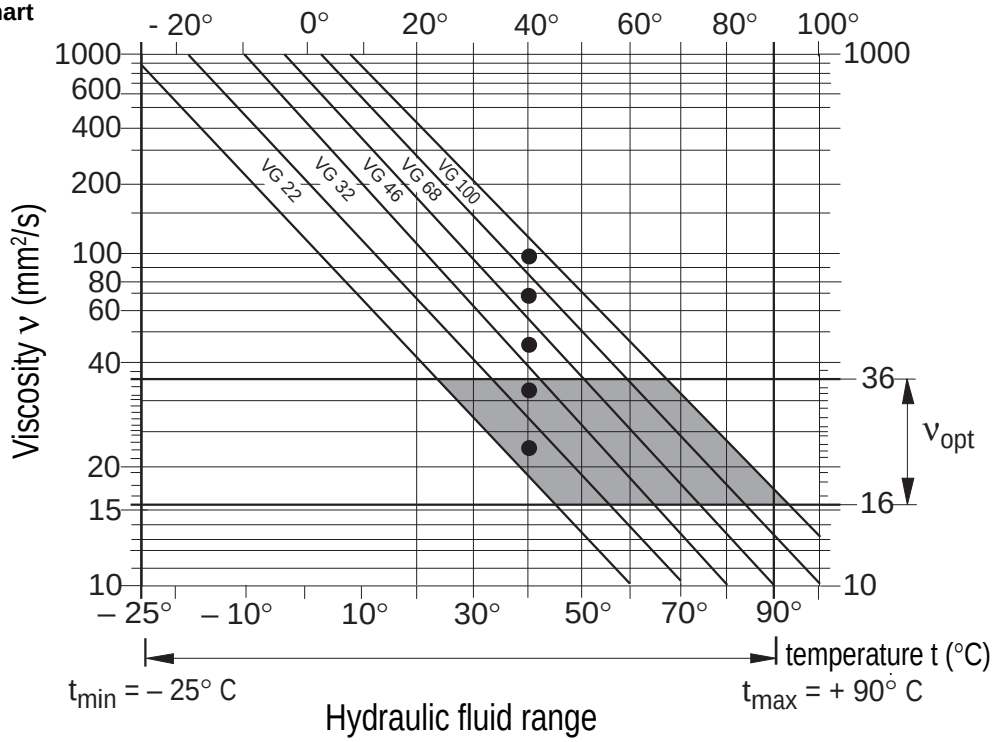
ν_{opt} = opt. opt. service viscosity 16...36 mm²/s

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

Limiting viscosity range
Service limits are set at the following values:
ν_{min} = 10 mm²/s
briefly at max. permissible leakage oil temperature of 90 °C.
ν_{max} = 1000 mm²/s
briefly on cold start.

Temperature range (see selection chart)
t_{min} = –25 °C
t_{max} = +90° 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 (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: An ambient temperature of X °C will produce an operating temperature in the tank of 60 °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, 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.

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_1):
$p_{L\ max}$ ——— 2 bar absolut
Always given with end-face leakage oil bore allowing unrestricted drainage into transmission housing.

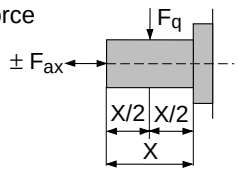
Pressure at lubrication oil port G:
$p_{abs\ min}$ = 1bar

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

Size				45	63
Displacement volume		$V_{g\ max}$	cm^3	45	63
Max. speed *	at $V_{g\ max}$	$n_{o\ max}$	rpm	2750	2600
Max. volumetric flow (delivery)	at $n_{o\ max}$	$q_{Vo\ max}$	L/min	123	163
Max. power (Δp = 250 bar)	at $n_{o\ max}$	$P_{o\ max}$	kW	52	68
Max. torque (Δp = 250 bar)	at $V_{g\ max}$	T_{max}	Nm	181	250
Moment of inertia around drive axle		J	kgm^2	0.0047	0.0056
Fluid capacity			L	0.6	0.8
Mass (without fluid)		m	kg	27.2	28.5
Permissible load on drive shaft: max. permissible axial force		$F_{ax\ max}$	N	1500	1500
max. permissible lateral force		$F_{q\ max}$	N	1500	1500

*intermittently 3000 rpm

Application of force



Calculating size

Volumetric flow $q_V = \frac{V_g \cdot n \cdot \eta_v}{1000}$ [L/min]

Drive torque $T = \frac{1.59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}}$ [Nm]

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]

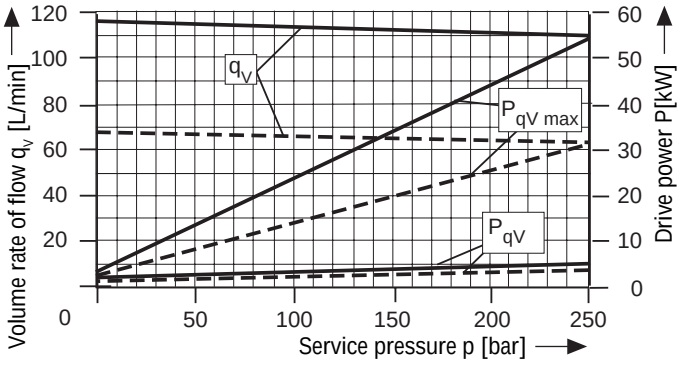
V_g = geometric displacement volume [cm^3] per revolution
Δp = pressure differential [bar]
n = speed [rpm]
η_v = volumetric efficiency
η_{mh} = mechanical-hydraulic efficiency
η_t = total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

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 °C)

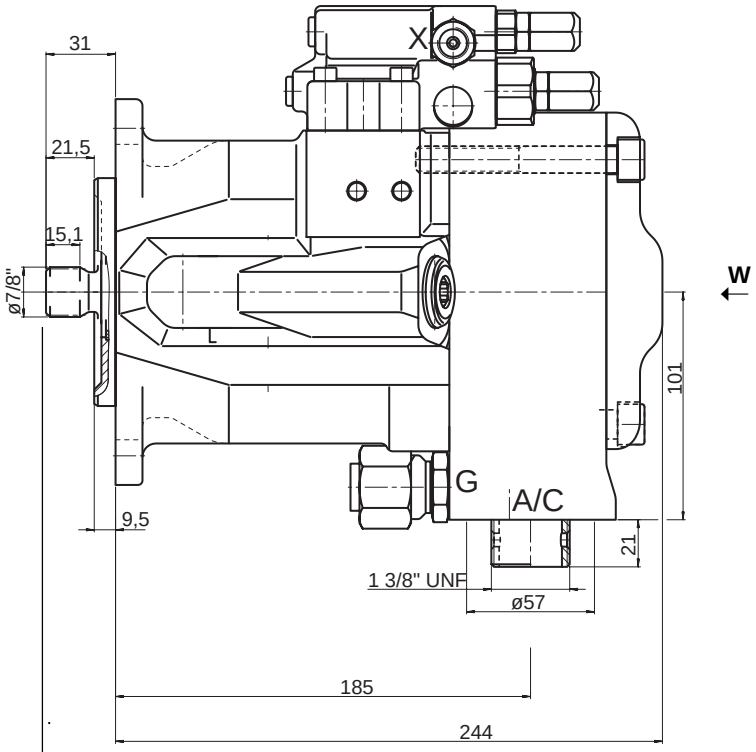
Size 45

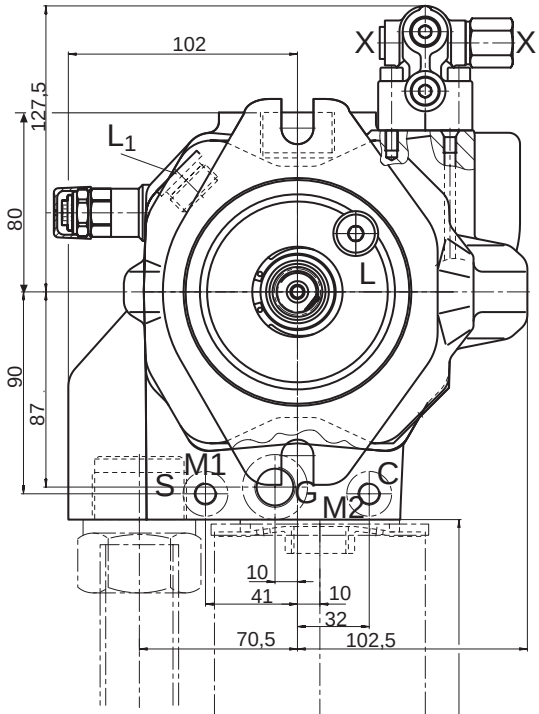
– – – – n = 1500 rpm
——— n = 2600 rpm



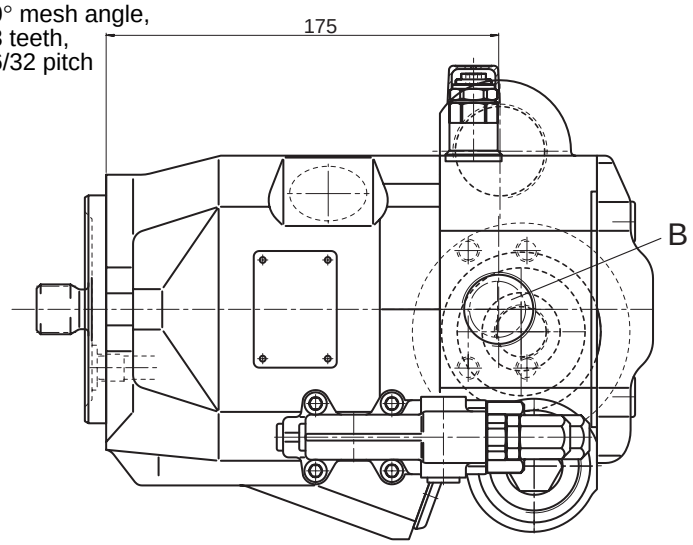
Unit dimensions size 45, clockwise direction of rotation

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



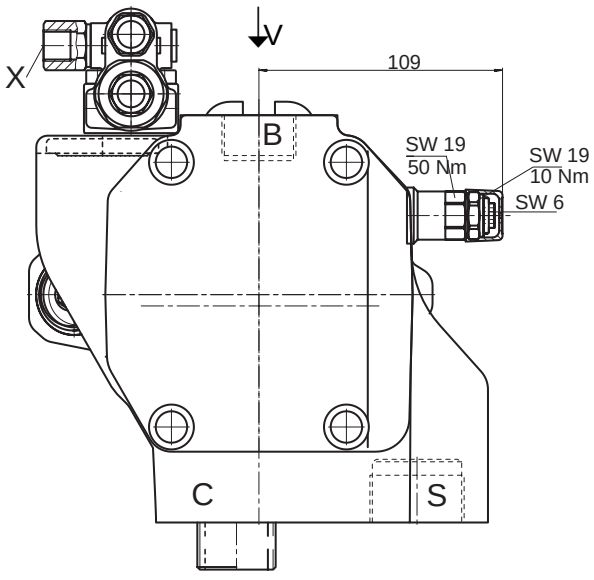


Shaft 22-4 (SAE B) shortened
SAE J744 OCT 83
30° mesh angle,
13 teeth,
16/32 pitch

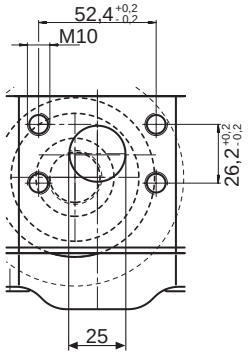


Filter supplied with unit
for type F

View W



View V
Pressure port B
model 12

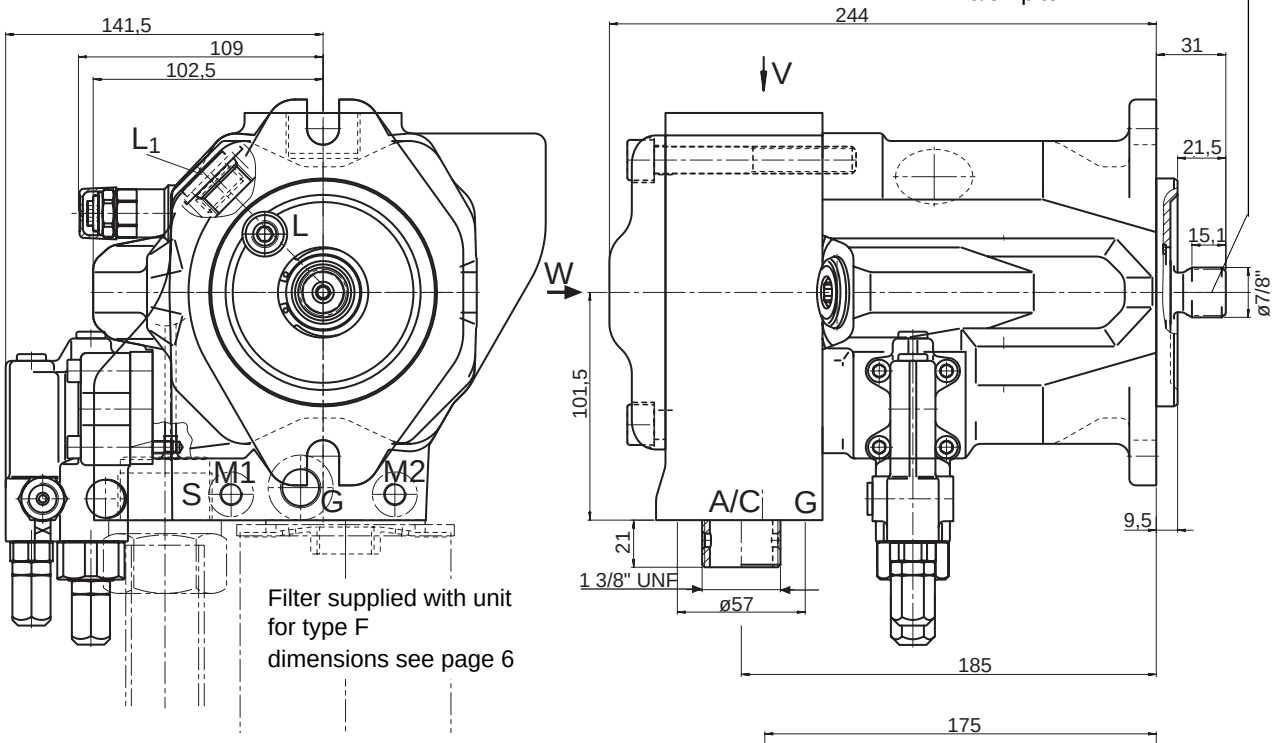


Ports see page 7

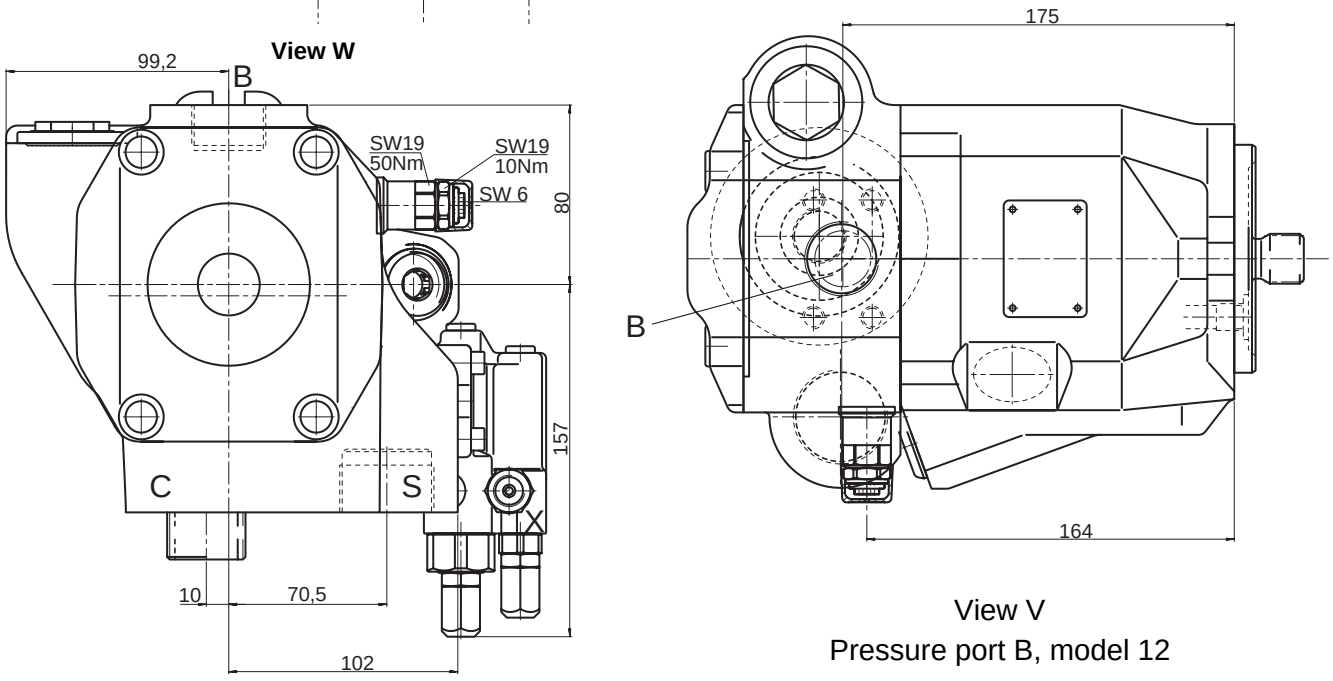
Unit dimensions size 45, anti-clockwise direction of rotation

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

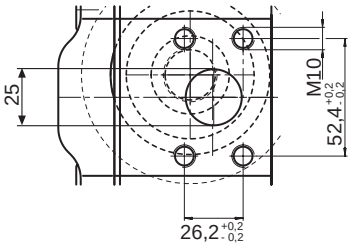
Shaft 22-4 (SAE B) shortened
SAE J744 OCT 83
30° mesh angle,
13 teeth,
16/32 pitch



Filter supplied with unit
for type F
dimensions see page 6



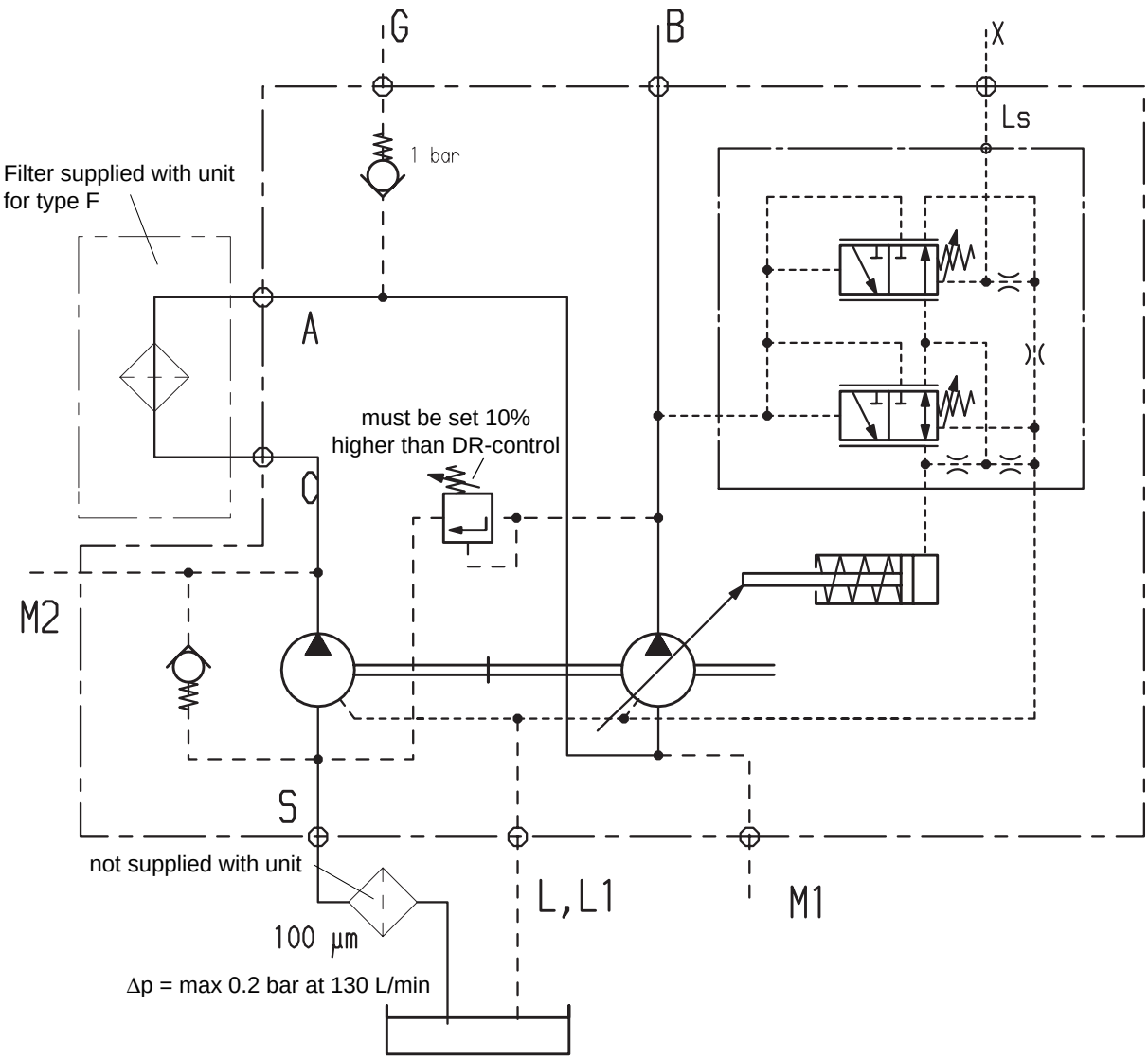
View V
Pressure port B, model 12



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 diagram

Type 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, L_1 Case drain ports
X Control pressure port

with pressure controller DR – X port closed

G Transmission lubrication port
M_1, M_2 Measurement ports