Targeted engineering design

Hedge and Grasscutter mowers

CASAPPA®

FLUID POWER DESIGN

Fixed displacement axial piston pump and motor swash plate design for open circuit

One of Casappa's aims is to produce targeted engineering solutions to improve machine performance.

The new fixed displacement axial piston pump and motor has a higher output than gear pumps and motors.

The standardized connecting flanges comply with SAE and European regulations and permit use for diverse applications.

The design itself is extremely compact while integrating a number of functions, with an electrically controlled valve on the pump and anti-shock valves on the motor.

The compact motor size means it can be directly coupled to the bush-cutter's rotor.

This open circuit solution does not in any way restrict the use of all the machine's accessories and avoids all the problems that may be encountered with closed circuits.

Pump

➢ **Integrated pump functions**

- Three-position electrically controlled valve with relief valve
- Electronic control of the rotor start-up and stop ramps
- Rotation reverse with controlled delay
- Easy integration with the machine cabin controls
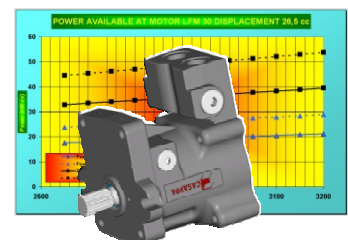- Auxiliary gear pump with common suction, available with either cast-iron or aluminum body
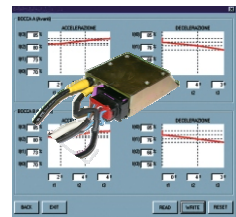
Motor

➢ **Excellent performance**

- Power up to 63 kW – 85 Hp output (at maximum speed)

➢ **Flexibility**

- Reversible rotation with integral anti-shock valves
- European and SAE standard mounting flanges
- Side or rear inlet options
- Compact size

Filters

➢ **Long life hydraulic components with Ikron-Casappa filters**

- Full range
- Filtering elements in line with world standards

01/03.03

Technical data - Pump

Technical data (with HL or HLP mineral oil based hydraulic fluid to DIN 51524)

Pump type			LFP 48.27 (*)	LPF 48.34 (*)	LFP 48.36,7	LFP 48.45,5 (*)	LPF 48.48
Displacement (theor.) V	[cm^3/rev]		27	34	36,7	45,5	48,2
Direction of rotation defined looking at the drive shaft			Anti-clockwise (S) - Clockwise (D)				
Drain			Internal				
Max. inlet pressure	[bar ass.]	min.	0,7				
		max.	3				
Max. outlet pressure	[bar]	cont.	280				
		int.	315				
		peak	350				
Max speed n$_{max}$	[min^{-1}]	(1)	2600				
Max speed with inlet . supercarged n$_{max}$	[min^{-1}]	@ V$_{max}$	3100				
Max. delivery (theor.)	[l/min]	@ 2600 min^{-1}	70,2	88,4	95,4	118	125
Max. power (theor.) (Δp= 280 bar)	[KW]- ([cv])	@ 2600 min^{-1}	32,1 (43,7)	41,2 (56)	43,7 (59,4)	55 (74,8)	58,5 (79,6)
Max. torque (theor.)	[Nm]	Δp = 280 bar	120	151	163	200	214
		Δp = 100 bar	43	54	58	72	76
Moment of inertia	[kgm^2]		0,0030				
Max. permissible loading on drive shaft	[N]	F$_{ax}$	1500				
		F$_{rad}$	1500				
Fill capacity	[l]		0,9				
Mass (without oil)	[kg]		35				
Seals			N= Buna				
Operating temperature	[°C]	with Buna seals	-25 ÷ +90				

(*) Availability
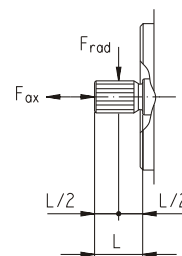cont. = continuous
int. = intermittent
F$_{ax}$ = axial force
F$_{rad}$ = radial force
(1) = with an inlet pressure of 1 bar abs.
For different working conditions, please consult our sales department.

External load position

FLUID VISCOSITY

The fluid viscosity range for optimal use of PLATA pumps and motors is between 15 and 35 mm^2/s (cSt).

Limit functional conditions are:
1500 mm^2/s at start up at -25 °C
10 mm^2/s at maximum temperature of 90 °C.

Q	[l/min]	Delivery
M	[Nm]	Torque
P	[kW]	Power
P	[cv]	Power [kW] • 1,36
V	[cm^3/rev]	Displacement
n	[min^{-1}]	Speed
Δp	[bar]	Pressure
$\eta_v = \eta_v$ (V,$_{Δp,}$ n)		Volumetric efficiency
$\eta_m = \eta_m$ (V,$_{Δp,}$ n)		Mechanical efficiency
$\eta_t = \eta_v • \eta_m$		Overall efficiency

FILTERS

For a maximum pump life, we recommend the use of filtration systems suitable to contain the hydraulic fluid contamination in the class 16/13 conforming to ISO 4406. Satisfactory operation is obtained also with contamination class 19/15 conforming to ISO 4406 or with cleanliness grade 9 conforming to class NAS 1638.

CASAPPA recommends to use its own production filters:

IKRON
Fluid Filtration

DESIGN CALCULATION FOR PUMP

$$Q = V • \eta_v • n • 10^{-3} \quad [l/min]$$

$$M = \frac{Δp • V}{62,83 • \eta_m} \quad [Nm]$$

$$P = \frac{Δp • V • n}{600 • 1000 • \eta_t} \quad [kW]$$

01/03.03

Technical data - Motor

Technical data (with HL or HLP mineral oil based hydraulic fluid to DIN 51524)

| Motor type			LFM 30.22	LPFM30.26,5 (*)	LFM 30.28,5	LFM 30.30,2 (*)
Displacement (theor.) V	[cm^3/rev]		22	26,5	28,5	30,2
Direction of rotation defined looking at the drive shaft			Reversible (R)			
Drain			External			
Max. inlet pressure	[bar]	cont.	280			
		int.	315			
		peak	350			
Max. drain line pressure	[bar abs.]		2			
Max speed n_{max}	[min^{-1}]		4900	4800	4700	4500
Max. delivery (theor.)	[l/min]	@ n_{max} min^{-1}	108	127	134	136
Max. power (theor.) (Δp= 280 bar)	[kW]-[(cv)]	@ 2400 min^{-1}	24,64 (33,51)	29,68 (40,36)	31,92 (43,41)	33,82 (46)
Max. power (theor.) (Δp= 280 bar)	[kW]-[(cv)]	@ 2800 min^{-1}	28,75 (39,1)	34,62 (47,08)	37,24 (50,64)	39,46 (53,66)
Max. power (theor.) (Δp= 280 bar)	[kW]-[(cv)]	@ 3200 min^{-1}	32,85 (44,68)	39,57 (53,81)	42,56 (57,88)	45,09 (61,32)
Max. torque (theor.)	[Nm]	Δp = 280 bar	98	118	126	134
Starting torque	[Nm]	Δp = 250 bar	55	66,4	71,4	75,6
Max. permissible loading on drive shaft	[N]	F_{ax}	1000			
		F_{rad}	1500			
Fill capacity	[l]		0,5			
Mass (without oil)	[kg]		14			
Seals			N= Buna			
Operating temperature	[°C]	with Buna seals	-25 ÷ +90			

(*) Availability
cont. = continuous
int. = intermittent
F_{ax} = axial force
F_{rad} = radial force
For different working conditions, please consult our sales department.

External load position
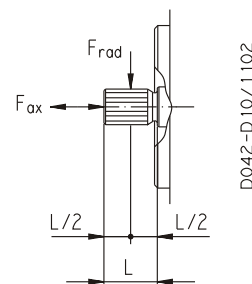
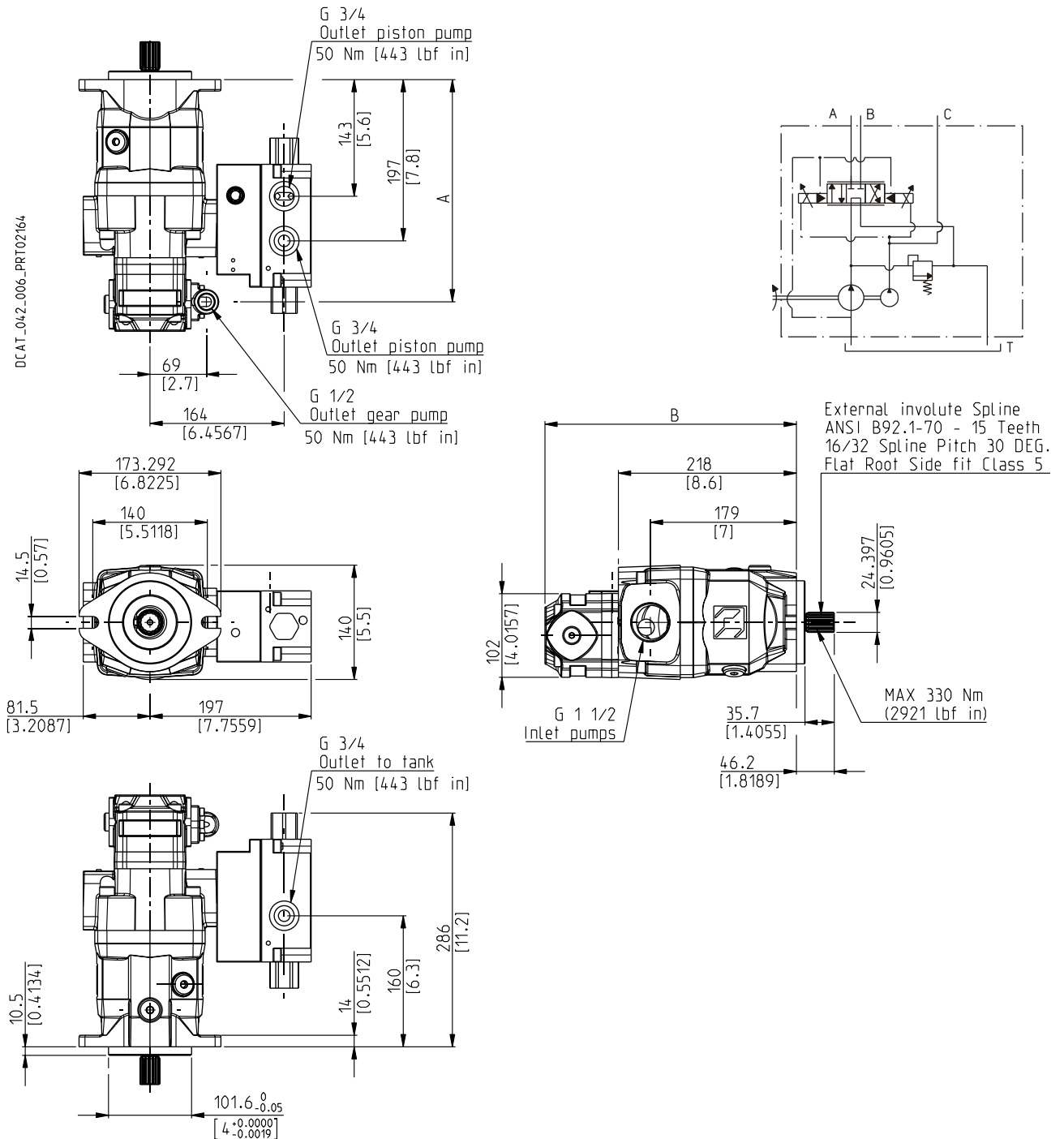|		
Q	[l/min]	Delivery
M	[Nm]	Torque
P	[kW]	Power
P	[cv]	Power [kW] • 1,36
V	[cm^3/giro]	Displacement
n	[min^{-1}]	Speed
Δp	[bar]	Pressure
$\eta_v = \eta_v (V,_{\Delta p}, n)$		Volumetric efficiency
$\eta_m = \eta_m (V,_{\Delta p}, n)$		Mechanical efficiency
$\eta_t = \eta_v • \eta_m$		Overall efficiency

DESIGN CALCULATION FOR MOTOR

$$Q = \frac{V • n • 10^{-3}}{\eta_v} \quad [l/min]$$

$$M = \frac{\Delta p • V • \eta_m}{62,83} \quad [Nm]$$

$$P = \frac{\Delta p • V • n • \eta_t}{600 • 1000} \quad [kW]$$

01/03.03

DCAT042-002

Fixed displacement axial piston pump swash plate design

G 3/4
Outlet piston pump
50 Nm [443 lbf in]

14.3 [5.6]
197 [7.8]
A

DCAT_042_006_PRT02164

69 [2.7]
164 [6.4567]

G 3/4
Outlet piston pump
50 Nm [443 lbf in]

G 1/2
Outlet gear pump
50 Nm [443 lbf in]

173.292 [6.8225]
140 [5.5118]
14.5 [0.57]
140 [5.5]
81.5 [3.2087]
197 [7.7559]

A   B   C

T

B
218 [8.6]
179 [7]
102 [4.0157]
24.397 [0.9605]

External involute Spline
ANSI B92.1-70 - 15 Teeth
16/32 Spline Pitch 30 DEG.
Flat Root Side fit Class 5

G 1 1/2
Inlet pumps

35.7 [1.4055]
46.2 [1.8189]

MAX 330 Nm
(2921 lbf in)

G 3/4
Outlet to tank
50 Nm [443 lbf in]

286 [11.2]
160 [6.3]
14 [0.5512]
10.5 [0.4134]

101.6 0/-0.05 [4 +0.0000/-0.0019]

To place your order contact our sales service dept.

	Auxiliary gear pump cast-iron body - KAPPA series								
	20.4	20.6,3	20.8	20.11,2	20.14	20.16	20.20	20.25	20.31,5
A (mm)	260	262	264,5	268	266,5	272	278,5	271,5	281,5
B (mm)	302,5					308		323	

01/03.03

Fixed displacement axial piston motor swash plate design

50.8 +0.03 -0.06
[2 +0.0011 -0.0023]

46 [1.811]

129 [5.1]

5 [0.1969]

17.5 [0.69]

50 [1.9685]

Rear port version (P).

146 [5.748]

122 [4.8032]

98 [3.8583]

N°4 HOLES Ø11 [0.4331]

Plug BSPP G 1/2

42 [1.6535]

137 [5.3937]

86 [3.3858]

14.5 [0.5709]

128±0.1 [5.0394±0.00391]

133 [5.2362]

174 [6.8504]

MAX PRESSURE VALVES FOR BOTH ROTATIONS

158 [6.2]

83 [3.3]

47 [1.8504]

205 [8.0709]

Drain port G 1/2

ANSI B 92.1a-1976 CLASS 5-15 TEETH 16/32D.P.-ang.=30° flaat root-side fit

MAX 330 Nm 2921 in lbs

115 [4.5276]

G 3/4 50 Nm [443 lbf in]

G 3/4 50 Nm [443 lbf in]

50 [1.9685]

DCAT_042_002_PRT01205

Side port version (L).

It is not possible to have both side and rear inlets on the same motor.
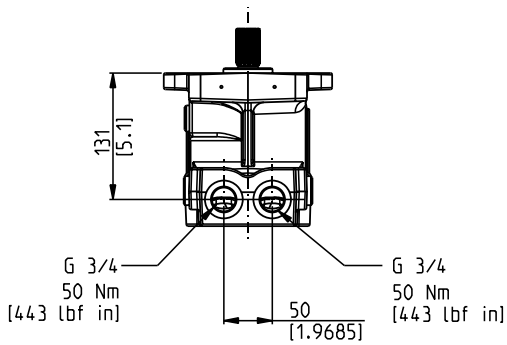
131 [5.1]

G 3/4 50 Nm [443 lbf in]

G 3/4 50 Nm [443 lbf in]

50 [1.9685]

Conversion flange E3 - S5
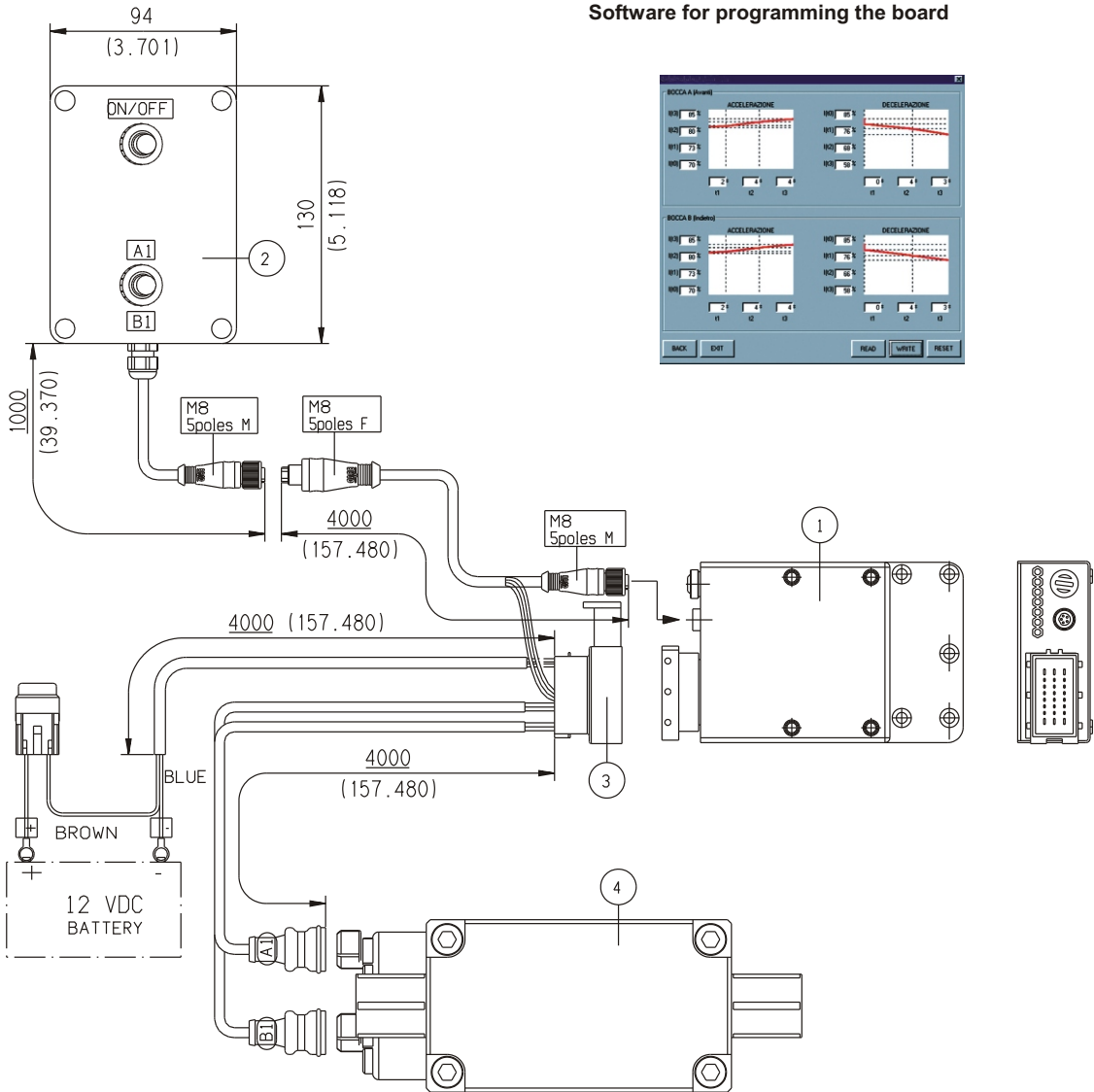

Ø101.6 [4]

8 [0.315]

01/03.03

To place your order contact our sales service dept.

DCAT042-002
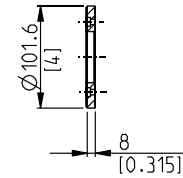
Electronic control components for integral pump valve

Software for programming the board

94
(3.701)

ON/OFF

130
(5.118)

A1

②

B1

1000
(39.370)

M8
5poles M

M8
5poles F

4000
(157.480)

M8
5poles M

①

4000 (157.480)

③

BLUE

4000
(157.480)

BROWN

12 VDC
BATTERY

A1

B1

④

D042-D09/1102

Item	Description
1	Electronic board
2	Control box
3	Cable kit
4	Electrically controlled valve

CASAPPA®
FLUID POWER DESIGN