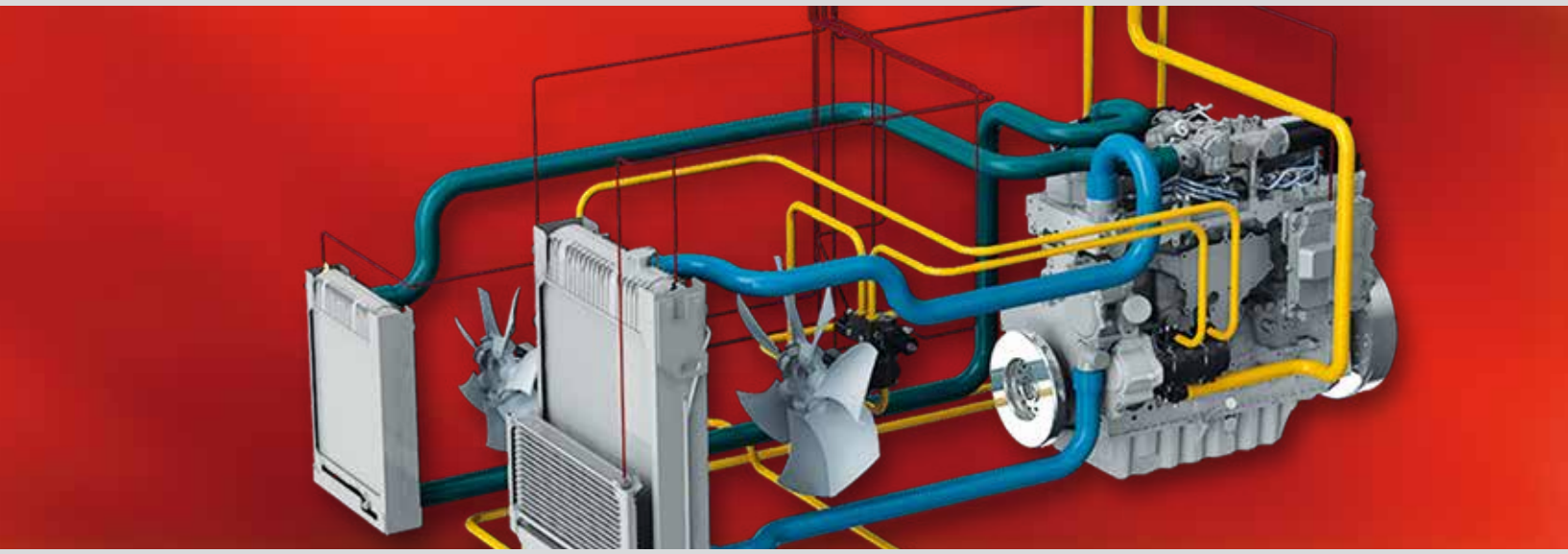
CASAPPA®
FLUID POWER DESIGN



ELECTRO-HYDRAULIC FAN DRIVE SYSTEM

INDEX

O 06/12.2022

O Modification from former edition.

INTRODUCTION

One of Casappa's aims is to develop targeted engineering solutions to improve machine performance.
Designers of vehicle cooling systems require complete and flexible control systems.
A cooling fan featuring a hydraulic drive offers significant advantages over traditional solutions with electric or belt drives.

ADVANTAGES OF THE HYDRAULIC SYSTEM vs OTHER TECHNOLOGIES

- More powerful and more effective
- Reverse function available
- Energy savings and low noise level
- Flexibility in cooling system design
- Integrated controls
- Reduced overall dimensions

SOME APPLICATIONS

Construction & Mining • Material Handling • On-Highway Vehicles • Agriculture & Turf Care

05/02.2018

FAN DRIVE AVAILABLE SYSTEMS

HYDRAULIC FAN DRIVE

➢ **FIXED DISPLACEMENT SYSTEM**

Fan speed proportional to the engine speed

- Fixed ratio
  - Gear pump
  - Gear motor (with or without speed sensor)
  - Anti-cavitation valve
  - Pressure relief valve fixed setting
  - Pressure relief valve adjustable setting

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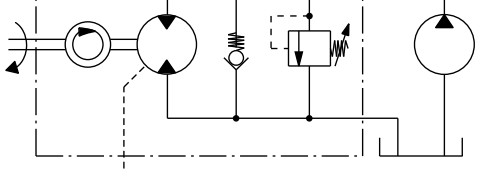
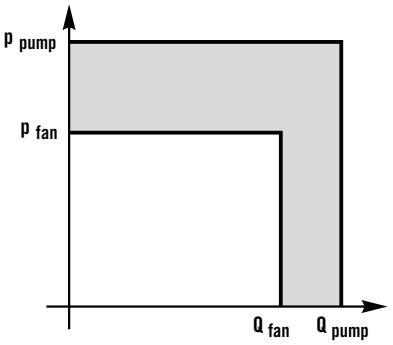


⊕ Low cost hydraulic solution

⊖ Energy waste



p= Pressure
Q= Delivery

Wasted power

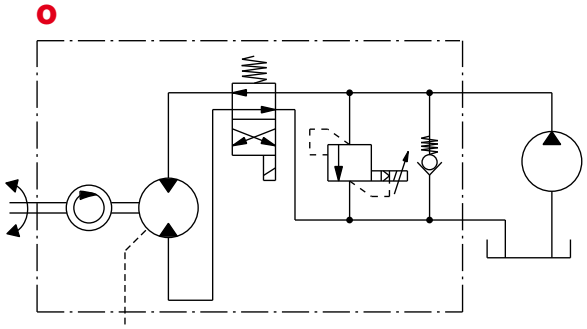
ELECTRO-HYDRAULIC FAN DRIVE

➢ **FIXED DISPLACEMENT SYSTEM**

Fan speed independent from engine speed

- Two speed
- Variable speed
- Variable speed and reverse function
  - Gear pump
  - Gear motor (with or without speed sensor)
  - Anti-cavitation valve
  - Proportional pressure relief valve or unloading valve
  - Proportional pressure relief valve and reverse valve
  - Electronic control unit and sensors

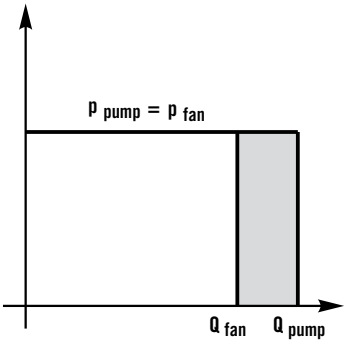
o



⊕ Energy saving compared to hydraulic fan drive solution

⊕ All the valves integrated in the motor

⊖ Still some energy waste



p= Pressure
Q= Delivery

Wasted power

Replaces: 05/02.2018

o 06/12.2022

FAN DRIVE AVAILABLE SYSTEMS

ELECTRO-HYDRAULIC FAN DRIVE

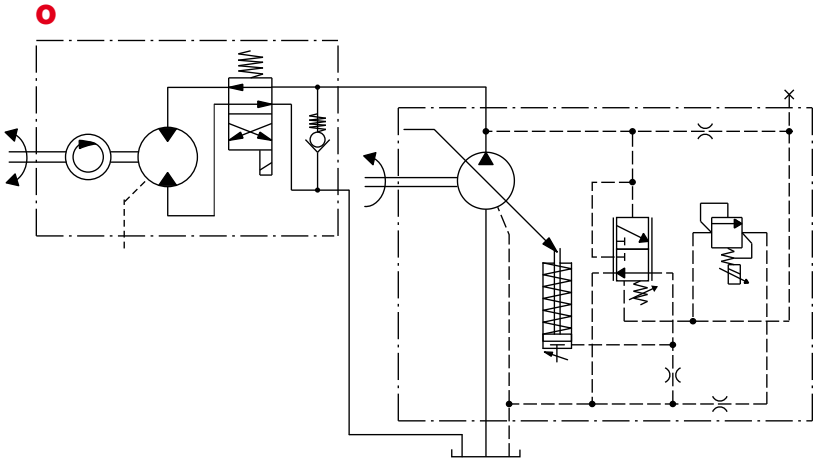
Replaces: 05/02.2018

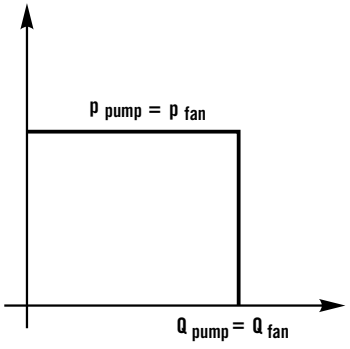
➢ **VARIABLE DISPLACEMENT SYSTEM**

Fan speed independent from engine speed

- Variable speed
- Variable speed and reverse function
  - Variable displacement axial piston pump
  - Fixed displacement gear motor (with or without speed sensor)
  - Pressure relief valve fixed setting
  - Pressure electronic compensator
  - Pressure electronic compensator and reverse valve
  - Electronic control unit and sensors

Enhanced energy saving



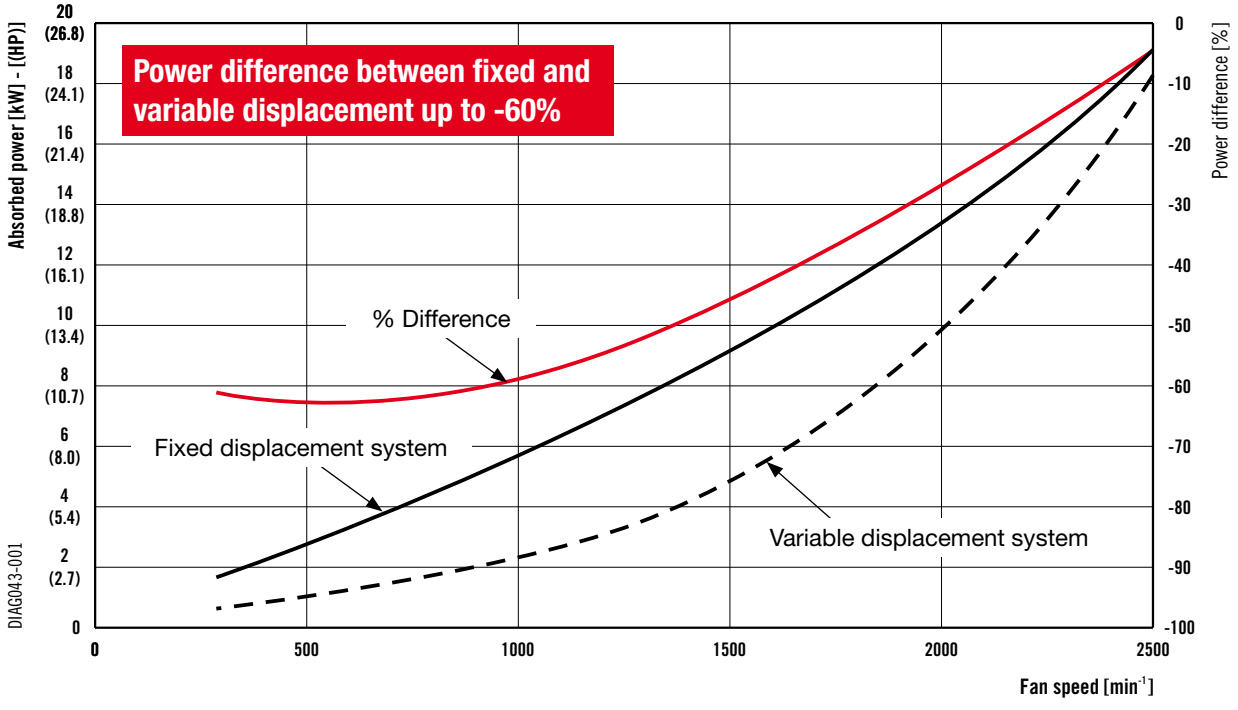


p= Pressure
Q= Delivery

ELECTRO-HYDRAULIC FAN DRIVE: FIXED vs VARIABLE DISPLACEMENT SYSTEM

POWER ABSORBED FROM ENGINE - COMPARISON EXAMPLE

06/12.2022



FIXED DISPLACEMENT SYSTEM - FIXED RATIO

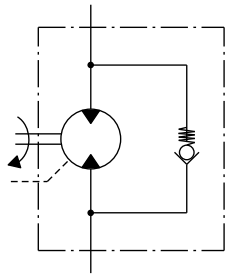
o

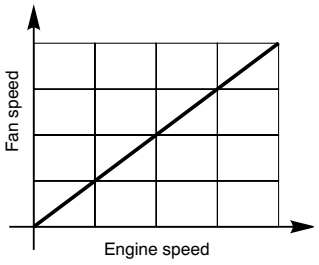
ANTI-CAVITATION VALVE — V8

▶ Mounting possibility: Polaris 20, Polaris PH20 gear motors and Kappa 30 HSY only with 22-27-31-34-38 displacements

ANTI-CAVITATION VALVE — V11

▶ Mounting possibility: Kappa 30 HSY gear motors only with 41-43-46-51-56 displacements

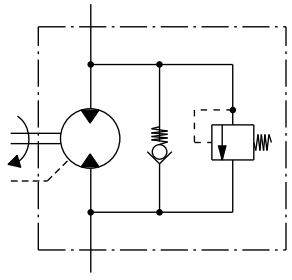


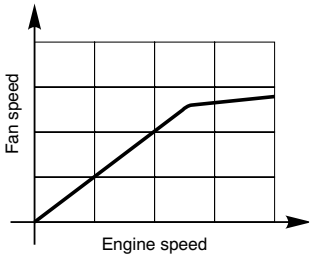


● Motor protected against every system stop

MAX. PRESSURE RELIEF VALVE FIXED SETTING AND ANTI-CAVITATION VALVE — VPIF (...)

▶ Mounting possibility: Polaris 20, Polaris PH20, Kappa 30 HSY gear motors o





● Motor protected against any pressure peak and every system stop

Max. pressure relief valve	Fixed setting pressure bar (psi) [a] (1)															
VPIF (1)	50 (725)	70 (1015)	80 (1160)	100 (1450)	120 (1740)	125 (1813)	140 (2030)	150 (2175)	160 (2320)	175 (2538)	180 (2610)	190 (2755)	200 (2900)	210 (3045)	230 (3335)	250 (3625

[a]: In the order write the pressure value in bar.
Max. flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

Order example: VPIF (160)

Replaces: 05/02.2018

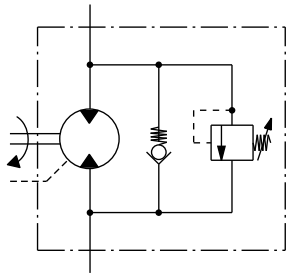
o 06/12.2022

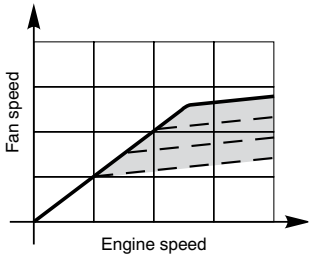
FIXED DISPLACEMENT SYSTEM - FIXED RATIO

Replaces: 05/02.2018

MAX. PRESSURE RELIEF VALVE ADJUSTABLE SETTING AND ANTI-CAVITATION VALVE — VMP5 (...)/TS/V9

▶ Mounting possibility: Polaris 20, Polaris PH20 gear motors





- Large size fans
- Motor protected against any pressure peak and every system stop
- System optimization thanks to adjustability

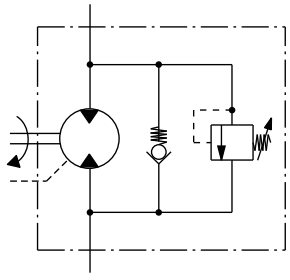
Max. pressure relief valve	② Adjustable setting pressure range bar (psi) [a]
VMP5 (②)/TS/V9	50 ÷ 220 (725 ÷ 3190)

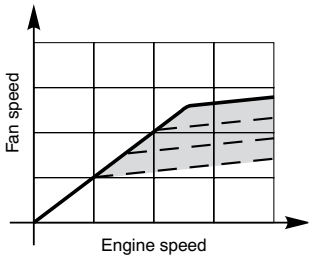
[a]: In the order write the pressure value in bar.
Max. flow rate Q=35 l/min (9.25 US gpm). Please contact us for different values.

Order example: VMP5 (170)/TS/V9

MAX. PRESSURE RELIEF VALVE ADJUSTABLE SETTING AND ANTI-CAVITATION VALVE — VPIR/...

▶ Mounting possibility: Kappa 30 HSY gear motors o





- Large size fans
- Motor protected against any pressure peak and every system stop
- System optimization thanks to adjustability

o 06/12.2022

Max. pressure relief valve	③ Spring type	④ Adjustable setting pressure range bar (psi) [a]
VPIR/③-④	N	10 ÷ 70 bar (145 ÷ 1015 psi)
	B	71 ÷ 130 bar (1030 ÷ 1885 psi)
	G	131 ÷ 210 bar (1900 ÷ 3045 psi)

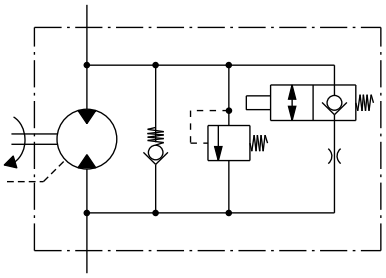
[a]: In the order write the pressure value in bar.
Max. flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

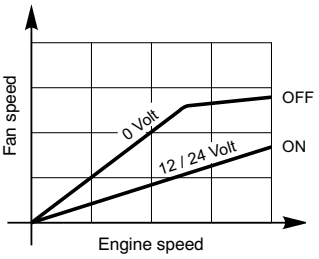
Order example: VPIR/G(180)

FIXED DISPLACEMENT SYSTEM - TWO SPEED

ON/OFF TWO SPEED VALVE (NORMALLY CLOSED)	**UNL ...**
MAX. PRESSURE RELIEF VALVE FIXED SETTING AND ANTI-CAVITATION VALVE	**VPIF (...)**

▶ Mounting possibility: Polaris 20, Polaris PH20 gear motors **O**





- Large size fans
- Motor protected against any pressure peak and every system stop
- ON/OFF solenoid valve to switch between two speed
  Intermediate speed adjustments are not possible

Unloading valve	❶ Voltage	❷ Mounting positions [a]	❸ Connectors [b]
UNL - ❶ - ❷ - ❸	**1** 12 V DC **2** 24 V DC	**B - C**	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [b]: Connectors see page 17.
Max. flow rate Q=45 l/min (11.89 US gpm). Please contact us for different values.

Max. pressure relief valve	❹ Fixed setting pressure value bar (psi) [a]															
VPIF (❹)	50 (725)	70 (1015)	80 (1160)	100 (1450)	120 (1740)	125 (1813)	140 (2030)	150 (2175)	160 (2320)	175 (2538)	180 (2610)	190 (2755)	200 (2900)	210 (3045)	230 (3335)	250 (3625

[a]: In the order write the pressure value in bar.
Max. flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

Order example: **UNL-2-C-M** / **VPIF (160)**

Replaces: 05/02.2018

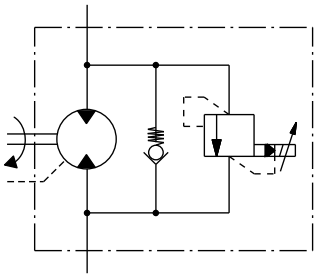
O 06/12.2022

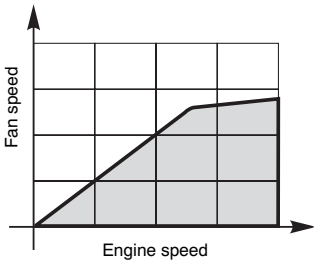
FIXED DISPLACEMENT SYSTEM - VARIABLE SPEED

PROPORTIONAL RELIEF VALVE	**PRV ...**
ANTI-CAVITATION VALVE	**V9**

▶ Mounting possibility: Polaris 20, Polaris PH20 gear motors

Replaces: 05/02.2018



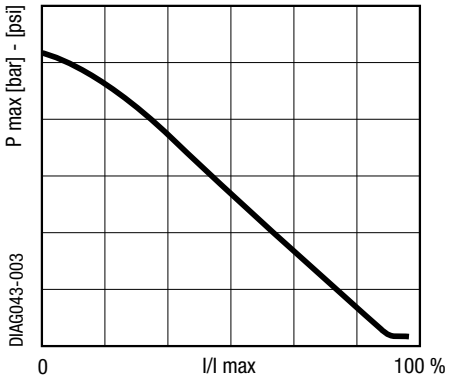


- Motor protected against every system stop
- Precise control of coolant temperature
- Maximum fan speed in case of control current failure

Proportional relief valve - Technical data ○

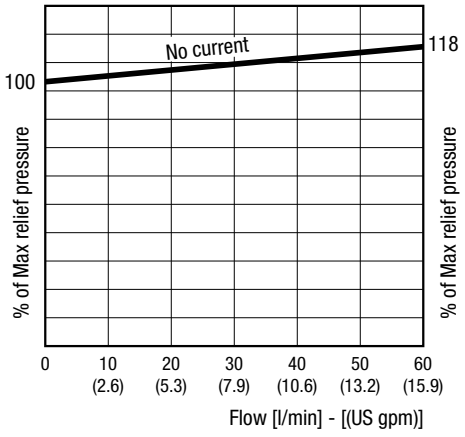
Max. flow	60 l/min (15.85 US gpm) - SAE10/2 cavity

Pressure/current curve



Pressure/flow curves

SAE10/2 CAVITY



○ 06/12.2022

Proportional relief valve	❶ Voltage	❷ Mounting positions [a]	❸ Max. pressure setting [b]	❹ Connectors [c]
PRV - ❶ - ❷ - ❸ - ❹	1 12 V DC 2 24 V DC	B - C	100 ÷ 250 bar (1450 ÷ 3625 psi)	M - D - S - JT/A

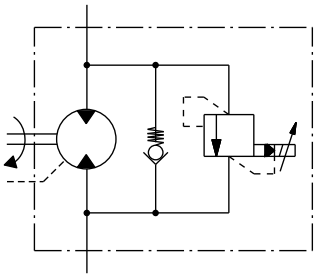
[a]: Mounting positions see page 16. - [b]: In the order write the pressure value in bar. - [c]: Connectors see page 17.
Please contact us for different working conditions.

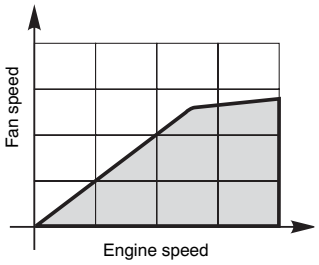
Order example: PRV-1-B-180-JT/A / V9

FIXED DISPLACEMENT SYSTEM - VARIABLE SPEED

PROPORTIONAL RELIEF VALVE	**PRV ...**
ANTI-CAVITATION VALVE	**V8/V11**

▶ Mounting possibility: Kappa 30 CSZ gear motors



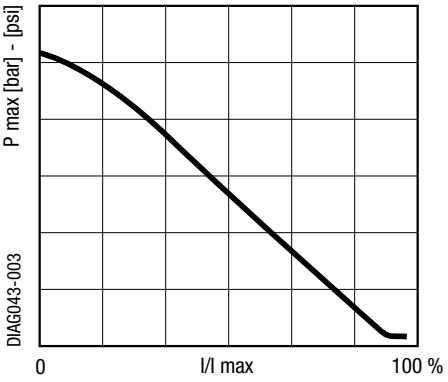


- Motor protected against every system stop
- Precise control of coolant temperature
- Maximum fan speed in case of control current failure

Proportional relief valve - Technical data

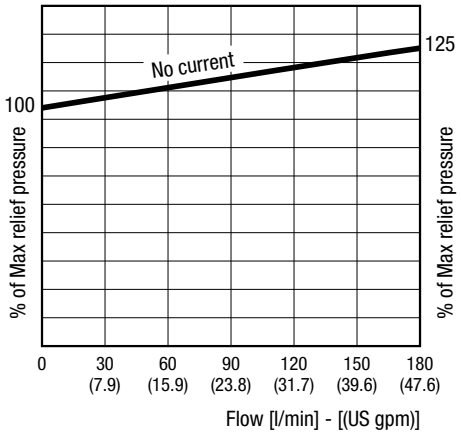
Max. flow	180 l/min (47.56 US gpm) - SAE12/2 cavity

Pressure/current curve



Pressure/flow curves

SAE12/2 CAVITY



Proportional relief valve	❶ Voltage	❷ Mounting positions [a]	❸ Max. pressure setting range [b]	❹ Connectors [c]
PRV - ❶ - ❷ - ❸ - ❹	**1** 12 V DC **2** 24 V DC	**B**	100 ÷ 250 bar (1450 ÷ 3625 psi)	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [b]: In the order write the pressure value in bar. - [c]: Connectors see page 17.
Please contact us for different working conditions.

Order example: **PRV-2-B-200-JT/A** / **V8**

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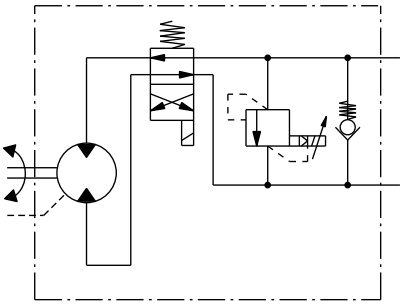
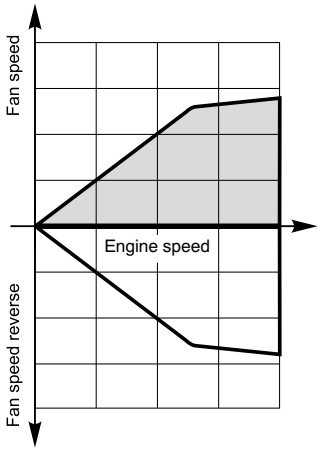
FIXED DISPLACEMENT SYSTEM - VARIABLE SPEED AND REVERSE FUNCTION

Replaces: 05/02.2018

PROPORTIONAL RELIEF VALVE	**PRV ...**
REVERSE VALVE	**REV ...**
ANTI-CAVITATION VALVE	**V8**

▶ Mounting possibility: Polaris 20 (SK), Polaris PH20 (SK) O



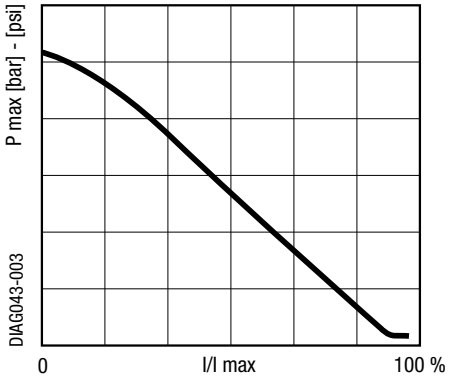


- Motor protected against every system stop
- Precise control of coolant temperature
- Reversible fan drive feature allows fan to clean radiator
- Maximum fan speed in case of control current failure

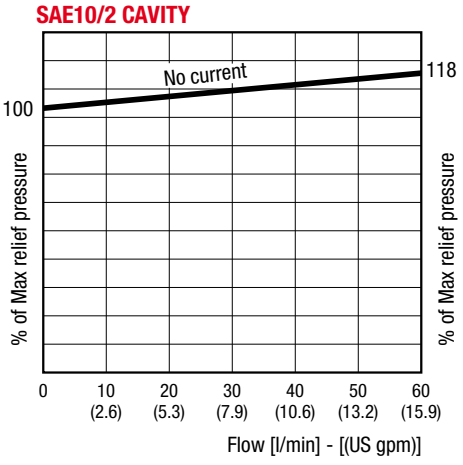
Proportional relief valve / Reverse valve - Technical data

Max. flow	60 l/min (15.85 US gpm) - SAE10/2 cavity

Pressure/current curve



Pressure/flow curves



Proportional relief valve	❶ Voltage	❷ Mounting positions [a]	❸ Max. pressure setting range [b]	❹ Connectors [c]
PRV - ❶ - ❷ - ❸ - ❹	**1** 12 V DC **2** 24 V DC	**B**	100 ÷ 250 bar (1450 ÷ 3625 psi)	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [b]: In the order write the pressure value in bar. - [c]: Connectors see page 17.
Please contact us for different working conditions.

O 06/12.2022

Reverse valve	❶ Voltage	❷ Mounting positions [a]	❹ Connectors [c]
REV - ❶ - ❷ - ❹	**1** 12 V DC **2** 24 V DC	**B**	**M - D - S - JT/A**

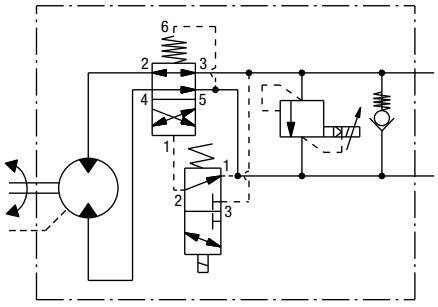
[a]: Mounting positions see page 16. - [c]: Connectors see page 17.
Please contact us for different working conditions.

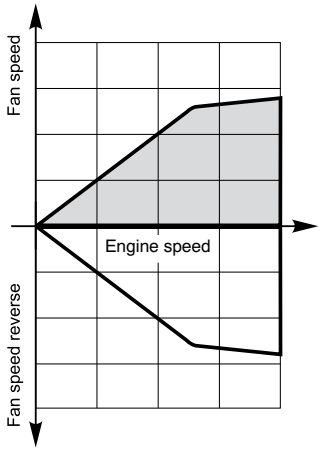
Order example: **PRV-2-B-180-D** / **REV-2-B-D** / **V8** **- SK** O

FIXED DISPLACEMENT SYSTEM - VARIABLE SPEED AND REVERSE FUNCTION

PROPORTIONAL RELIEF VALVE	**PRV ...**
REVERSE VALVE	**REVP ...**
ANTI-CAVITATION VALVE	**V8/V11**

▶ Mounting possibility: Kappa 30 CSK gear motors



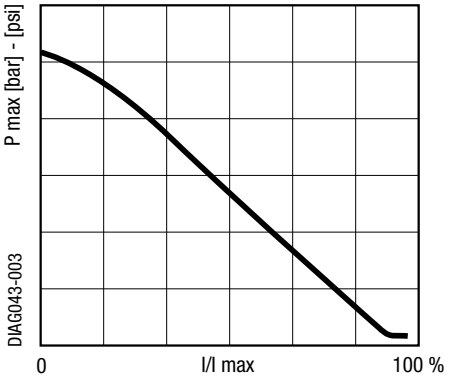


- Motor protected against every system stop
- Precise control of coolant temperature
- Reversible fan drive feature allows fan to clean radiator
- Maximum fan speed in case of control current failure

Proportional relief valve - Technical data

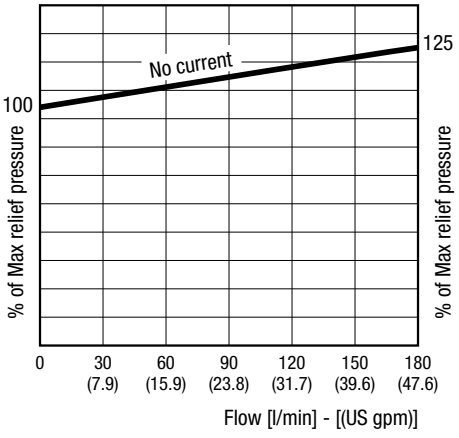
Max. flow	180 l/min (47.56 US gpm) - SAE12/2 cavity

Pressure/current curve



Pressure/flow curves

SAE12/2 CAVITY



Proportional relief valve	❶ Voltage	❷ Mounting positions [a]	❸ Max. pressure setting range [b]	❹ Connectors [c]
PRV - ❶ - ❷ - ❸ - ❹	**1** 12 V DC **2** 24 V DC	**B**	100 ÷ 250 bar (1450 ÷ 3625 psi)	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [b]: In the order write the pressure value in bar. - [c]: Connectors see page 17.
Please contact us for different working conditions.

Reverse valve	❶ Voltage	❷ Mounting positions (a)	❹ Connectors (c)
REVP - ❶ - ❷ - ❹	**1** 12 V DC **2** 24 V DC	**B**	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [c]: Connectors see page 13.
Please contact us for different working conditions.

Order example: **PRV-2-B-180-D** / **REVP-2-B-D** / **V8**

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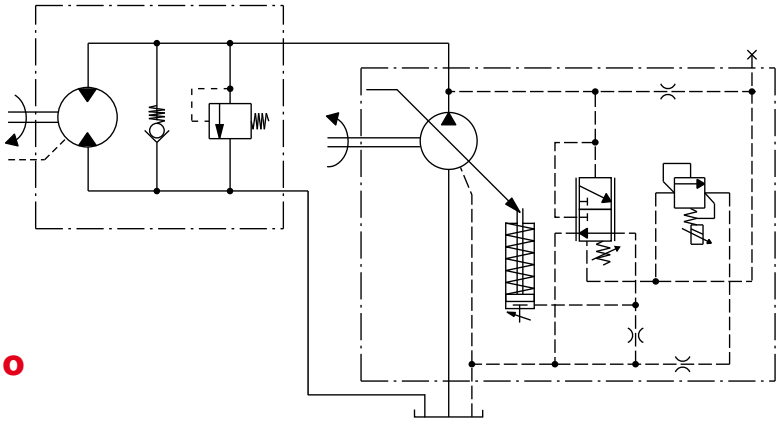
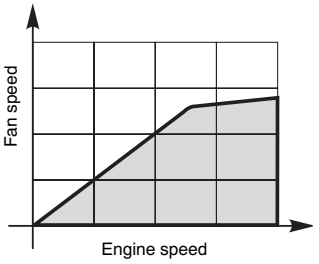
VARIABLE DISPLACEMENT SYSTEM - VARIABLE SPEED

PRESSURE ELECTRONIC COMPENSATOR (integrated on the pump)	**PEC ...**
MAX. PRESSURE RELIEF VALVE FIXED SETTING AND ANTI-CAVITATION VALVE (integrated on the motor)	**VPIF (...)**

▶ Mounting possibility: MVP piston pumps and Polaris 20, Polaris PH20, Kappa 30 HSY gear motors

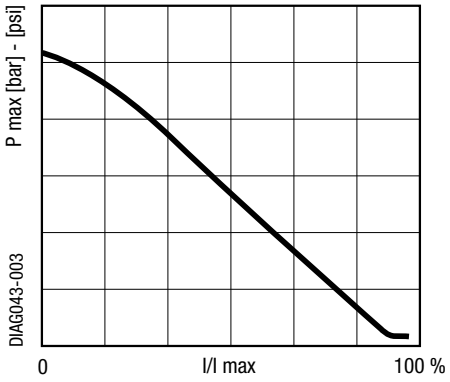
Replaces: 05/02.2018





- Enhanced energy saving
- The same piston pump can be used as main pump in a LS system
- Motor protected against every system stop
- Precise control of coolant temperature
- Maximum fan speed in case of control current failure

Pressure/current curve



Pressure electronic compensator	❶ Voltage	❷ Mounting positions [a]	❸ Min. pressure setting [b]	❹ Max. pressure setting [b]	❺ Connectors [c]
PEC - ❶ - ❷ - ❸ - ❹ - ❺	**1** NC 12 V DC **2** NC 24 V DC	**A - B**	To be defined according to the application	To be defined according to the application	**D**

[a]: Mounting positions see page 16. - [b]: In the order write the pressure value in bar. - [c]: Connectors see page 17.
For more information refer to the technical catalogue of variable displacements axial piston pumps MVP/MVPD series

Order example: **PEC-1-A-20/300-D** **- E** E: Max. displacement limiter

Max. pressure relief valve	❻ Fixed setting pressure value bar (psi) [d]															
VPIF (❻)	50 (725)	70 (1015)	80 (1160)	100 (1450)	120 (1740)	125 (1813)	140 (2030)	150 (2175)	160 (2320)	175 (2538)	180 (2610)	190 (2755)	200 (2900)	210 (3045)	230 (3335)	250 (3625

[d]: In the order write the pressure value in bar.
Maximum flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

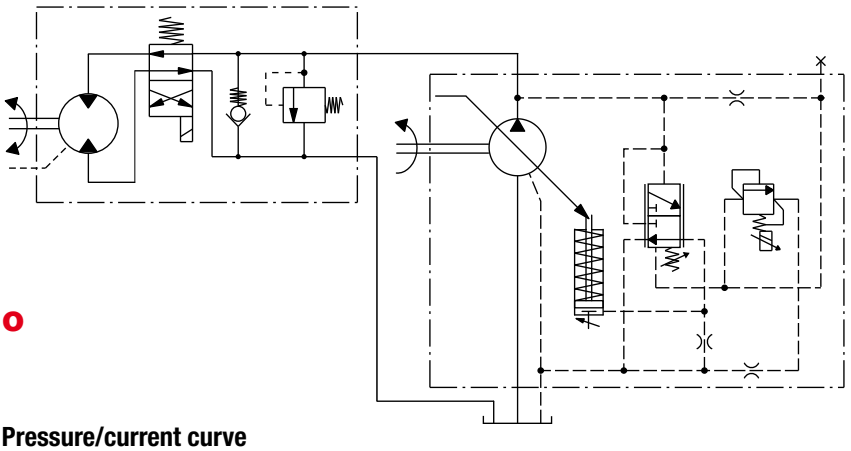
Order example: **VPIF (160)**

06/12.2022

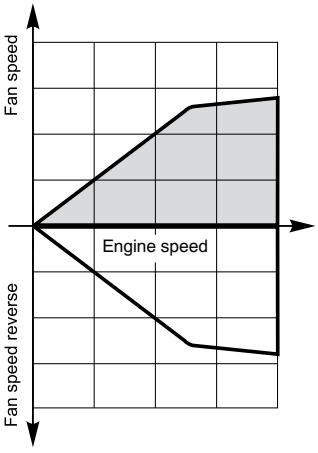
VARIABLE DISPLACEMENT SYSTEM - VARIABLE SPEED AND REVERSE FUNCTION

PRESSURE ELECTRONIC COMPENSATOR (integrated on the pump)	**PEC ...**
REVERSE VALVE (integrated on the motor)	**REV ...**
MAX. PRESSURE RELIEF VALVE FIXED SETTING AND ANTI-CAVITATION VALVE (integrated on the motor)	**VPIF (...)**

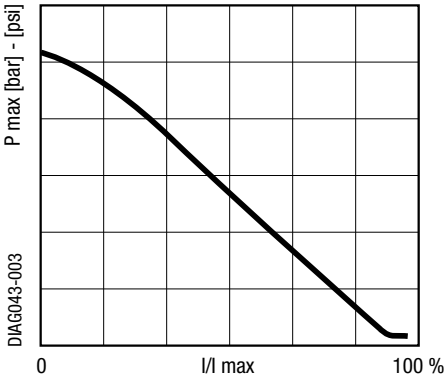
▶ Mounting possibility: MVP-MVPD piston pumps and Polaris 20 (SK), Polaris PH20 (SK) gear motors



o



Pressure/current curve



- Enhanced energy saving
- The same piston pump can be used as main pump in a LS system
- Motor protected against every system stop
- Precise control of coolant temperature
- Maximum fan speed in case of control current failure
- Reversible fan drive feature allows fan to clean radiator

o Pressure electronic compensator	❶ Voltage	❷ Mounting positions [a]	❸ Min. pressure setting [b]	❹ Max. pressure setting [b]	❺ Connectors [c]
PEC - ❶ - ❷ - ❸ - ❹ - ❺	**1** 12 V DC **2** 24 V DC	**A - B**	To be defined according to the application	To be defined according to the application	**D**

[a]: Mounting positions see page 16. - [b]: in the order write the pressure value in bar - [c]: Connectors see page 17.
For more information refer to the technical catalogue of variable displacements axial piston pumps MVP/MVPD series

Order example: **PEC-1-A-20/300-D** **- E** E: Max. displacement limiter

Reverse valve	❶ Voltage	❷ Mounting positions [a]	❺ Connectors [c]
REV - ❶ - ❷ - ❺	**1** 12 V DC **2** 24 V DC	**B**	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [c]: Connectors see page 17. Please contact us for different working conditions.

Max. pressure relief valve	❻ Fixed setting pressure value bar (psi) [d]															
VPIF (❻)	50 (725)	70 (1015)	80 (1160)	100 (1450)	120 (1740)	125 (1813)	140 (2030)	150 (2175)	160 (2320)	175 (2538)	180 (2610)	190 (2755)	200 (2900)	210 (3045)	230 (3335)	250 (3625

[d]: In the order write the pressure value in bar.
Maximum flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

Order example: **REV-2-B-D** / **VPIF (160)** **- SK** o

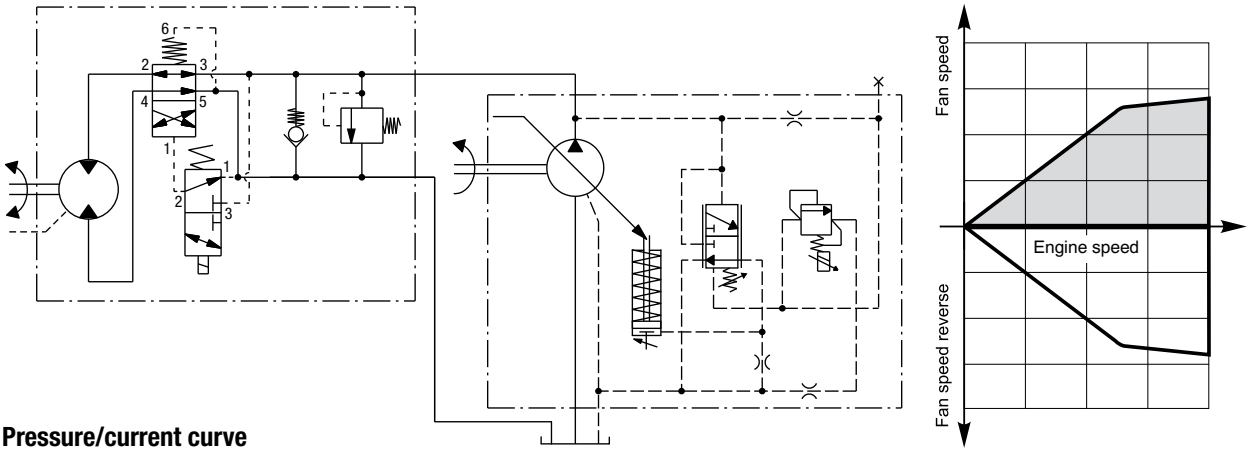
Replaces: 05/02.2018

o 06/12.2022

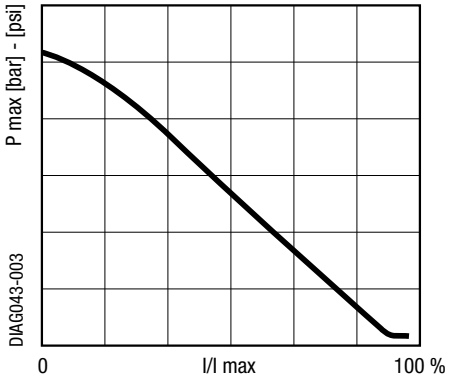
VARIABLE DISPLACEMENT SYSTEM - VARIABLE SPEED AND REVERSE FUNCTION

PRESSURE ELECTRONIC COMPENSATOR (integrated on the pump)	**PEC ...**
REVERSE VALVE (integrated on the motor)	**REVP ...**
MAX. PRESSURE RELIEF VALVE FIXED SETTING AND ANTI-CAVITATION VALVE (integrated on the motor)	**VPIF (...)**

▶ Mounting possibility: MVP-MVPD piston pumps and Kappa 30 CSK gear motors



Pressure/current curve



- Enhanced energy saving
- The same piston pump can be used as main pump in a LS system
- Motor protected against every system stop
- Precise control of coolant temperature
- Maximum fan speed in case of control current failure
- Reversible fan drive feature allows fan to clean radiator

Pressure electronic compensatorr	❶ Voltage	❷ Mounting positions [a]	❸ Min. pressure setting [b]	❹ Max. pressure setting [b]	❺ Connectors [c]
PEC - ❶ - ❷ - ❸ - ❹ - ❺	**1** 12 V DC **2** 24 V DC	**A - B**	To be defined according to the application	To be defined according to the application	**D**

[a]: Mounting positions see page 16. - [b]: in the order write the pressure value in bar - [c]: Connectors see page 17.
For more information refer to the technical catalogue of variable displacements axial piston pumps MVP/MVPD series

Order example: **PEC-1-A-20/300-D** **- E** E: Max. displacement limiter

Reverse valve	❶ Voltage	❷ Mounting positions [a]	❺ Connectors [c]
REVP - ❶ - ❷ - ❺	**1** 12 V DC **2** 24 V DC	**B**	**M - D - S - JT/A**

[a]: Mounting positions see page 16. - [c]: Connectors see page 17. Please contact us for different working conditions.

Max. pressure relief valve	❻ Fixed setting pressure value bar (psi) [d]															
VPIF (❻)	50 (725)	70 (1015)	80 (1160)	100 (1450)	120 (1740)	125 (1813)	140 (2030)	150 (2175)	160 (2320)	175 (2538)	180 (2610)	190 (2755)	200 (2900)	210 (3045)	230 (3335)	250 (3625

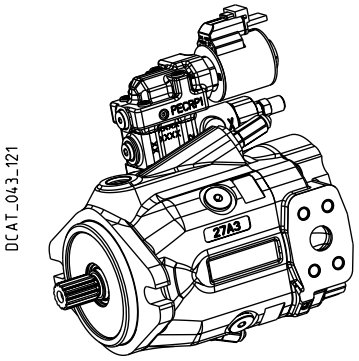
[d]: In the order write the pressure value in bar.
Maximum flow rate Q=60 l/min (15.85 US gpm). Please contact us for different values.

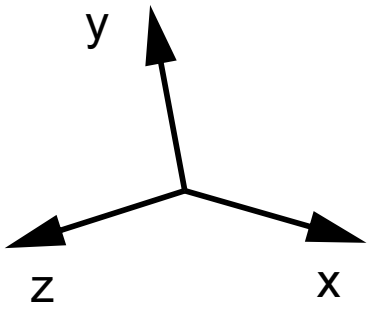
Order example: **REVP-2-B-D** / **VPIF (160)**

VALVE MOUNTING POSITIONS

MOUNTING POSITION A

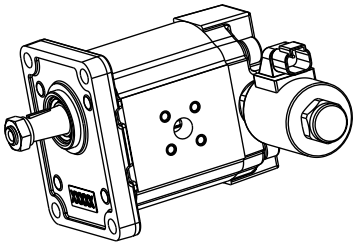
z axis oriented

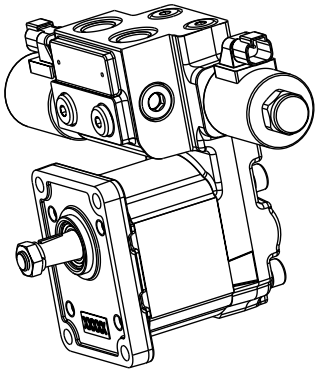




MOUNTING POSITION B

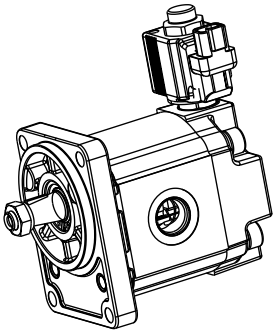
X axis oriented





MOUNTING POSITION C

Y axis oriented



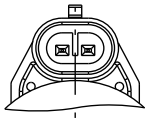
05/02.2018

Replaces: 05/02.2018

CONNECTORS

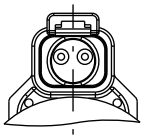
CONNECTOR: Metri Pack 150 **M**

Protection: IP69K with mating connector mounted



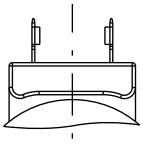
CONNECTOR: Deutsch DT04-2P **D**

Protection: IP69K with mating connector mounted



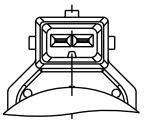
CONNECTOR: DIN 43650 **S**

Protection: IP65 with mating connector mounted



CONNECTOR: Junior Timer **JT/A**

Protection: IP67 with mating connector mounted



COILS FEATURES

POLARIS 20 AND POLARIS PH20 GEAR MOTORS O

Unloading vale

Connectors	Metri Pack 150, Deutsch DT04-2P, DIN 43650, Junior Timer	
Voltage	12 V DC	24 V DC
Dither frequency	150 Hz	150 Hz
Resistance at 20 °C (68 °F)	7,5 ± 3% Ohm	30 ± 5% Ohm

Proportional relief valve and reverse valve

Connectors	Metri Pack 150, Deutsch DT04-2P, DIN 43650, Junior Timer	
Voltage	12 V DC	24 V DC
Dither frequency	150 Hz	150 Hz
Resistance at 20 °C (68 °F)	5,5 ± 3% Ohm	21,33 ± 5% Ohm

MVP - MVPD PISTON PUMPS O

Pressure electronic compensator

Connectors	Deutsch DT04-2P, DIN 43650	
Voltage	12 V DC	24 V DC
Dither frequency	150 Hz	150 Hz
Resistance at 20 °C (68 °F)	4,9 ± 3% Ohm	17,1 ± 5% Ohm

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KAPPA 30 GEAR MOTORS O

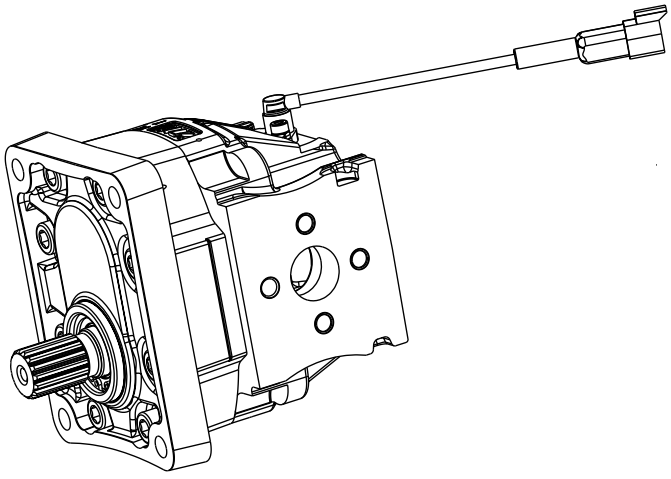
Proportional relief valve and reverse valve

Connectors	Metri Pack 150, Deutsch DT04-2P, DIN 43650, Junior Timer	
Voltage	12 V DC	24 V DC
Dither frequency	200 Hz	200 Hz
Resistance at 20 °C (68 °F)	7,09 ± 3% Ohm	28,5 ± 5% Ohm

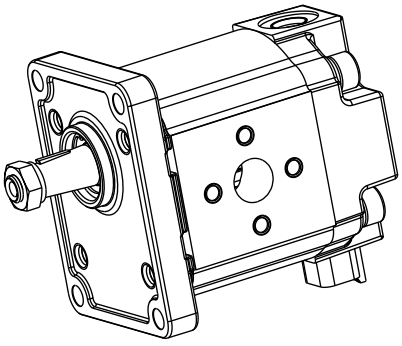
SPEED SENSOR

Flanged or integrated for speed detection of gearwheels.

FLANGED **SSF**



INTEGRATED **SSI**



SPEED SENSOR AVAILABILITY (WITHOUT VALVES)

Motor type	Speed sensor type	Without valves
KM30 (HSC)	SSF	X
PLM20	SSI	X
PHM20		X

X: Available combination

SPEED SENSOR AND VALVES AVAILABILITY

Motor type	Speed sensor type	Valve type									
		V8	V11	VPIF	VMP5	VPIR	UNL-VPIF	PRV-V9	PRV-V8/V11	PRV-REVP-V8	REVP-VPIF
KM30 (HSY)	SSF	X	X	X		X				X	X
KM30 (CSK)									X	X (●)	X (●)
PLM20	SSI	X		X	X	X	X (●)	X			
PHM20		X		X	X	X	X (●)	X			

X: Available combination - (●): Only with side drain port position

Notes
Please contact us for dimensions and ordering information.

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FLANGED SPEED SENSOR SSF

Electrical characteristics

Power supply	A. 4,5 ÷ 24 V DC B. 12,5 ÷ 32 V DC
Frequency range	0,1 ÷ 20 kHz
Operating temperature	-30 ÷ 125 °C (-22 ÷ 257 °F)
Cable length	C. 1000 mm (39.37 in) D. 150 mm (5.91 in)
Output type	NPN
Cable	3-core, 0,34 mm² (0.0005 in²) unshielded
Current load	< 40 mA
Short circuit immunity	Yes, outputs against ground: outputs against power supply Vbb max. 50 mA
Reverse polarity protection power supply lines	Yes, at correctly wired outputs (max. 50 mA)
Output	Rectangle, 1 frequency signal, open collector, without pull-up
Output signal level	Low: < 0,6 V
Duty cycle	50 % ±10%
Insulation strenght	500 V DC
Rise / fall time	< 10 µs
Max. pressure on sensing surface	Dynamic: 275 bar (3988 psi) Static: 275 bar (3988 psi)

EMC protection

Radiated immunity	Reference standards: ISO 11452-5 • Frequency range: 20 MHz ÷ 1 GHz • Test level: 100 V/m
Radiated immunity	Reference standards: ISO 11452-2 • Frequency range: 800 MHz ÷ 2 GHz • Test level: 100 V/m
Radiated immunity	Reference standards: EN 61000-4-3 • Frequency range: 80 MHz ÷ 2 GHz Test level: 3 V/m • Frequency range: 1,4 GHz ÷ 2 GHz Test level: 3 V/m
RF common mode	Reference standards: EN 61000-4-6 • Frequency range: 150 kHz ÷ 80 MHz Test level: 3 V
Fast transients	Reference standards: EN 61000-4-4 • Test level: 2000 V • Type of coupling: capacitive
Electrostatic discharge	Reference standards: EN 61000-4-2 • ±4 kV Contact discharge • ±8 kV Air discharge
Magnetic fields	Reference standards: EN 61000-4-5 • Axis: X, Y, Z • Level: 30 A/m • Frequency points: 16 2/3 Hz; 50 Hz; 60 Hz

Environmental resistance

Random noise	Reference standards: EN 60068-2-64 • a= 0,05 g² (RMS 10 g) • f= 20 ÷ 2000 Hz • Duration per axis (xyz): 5 h
Shock	Reference standards: EN 60068-2-27 • Type of shock: Half sine • Acceleration amplitude: = 100 g • Shock duration: 6 ms • Shock per axis (xyz): 12
IP67 Protection	Reference standards: EN 60529
IP6K9 Protection	Reference standards: ISO 20653
Salt spray test	Reference standards: EN 60068-2-11 • Test duration: 48 h
Temperature cycle test	Reference standards: EN 60068-2-14 • Temperature: -40 ÷ 125 °C (-40 ÷ 257 °F) • Transition time: 5 K/min • Hold time: 15 min • Number of cycles: 100
Temperature shock test	Reference standards: EN 60068-2-14 • 25 min @ 140 °C (284 °F) air • 10 min @ 20 °C (68 °F) water • Number of cycles: 20
Low temperature test	Reference standards: EN 60068-2-1 •Temperature: -40 °C (-40 °F) • Test duration: 16 h
High temperature test	Reference standards: EN 60068-2-2 • Temperature: 140 °C (284 °F) • Test duration: 16 h

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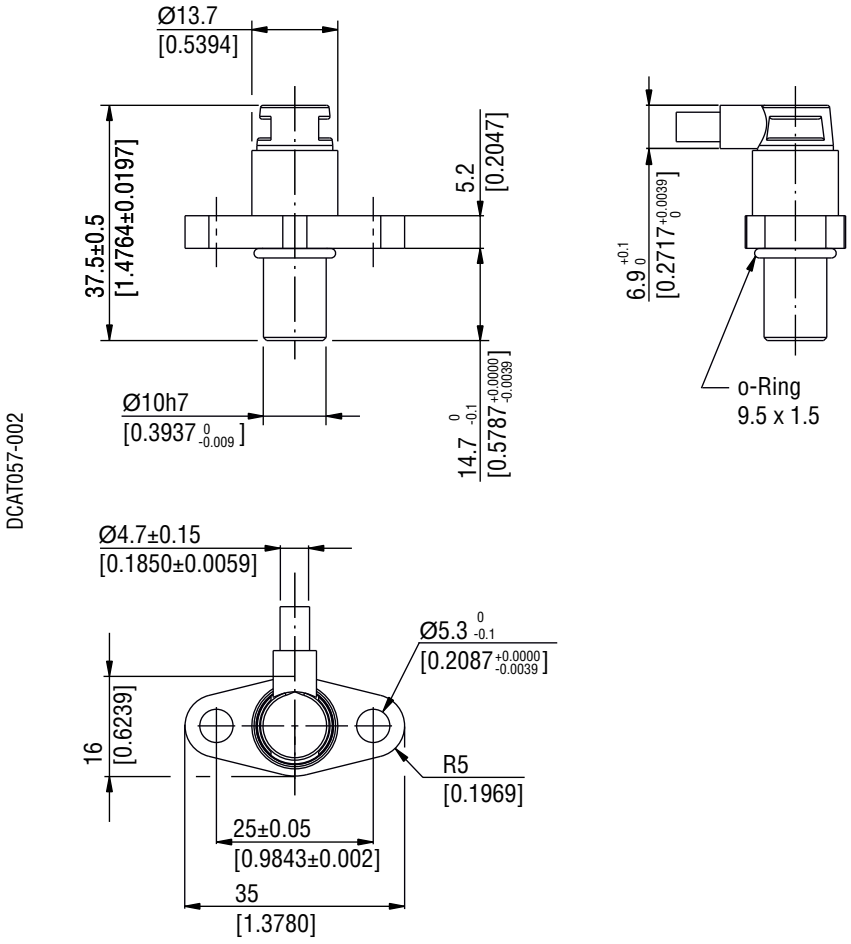
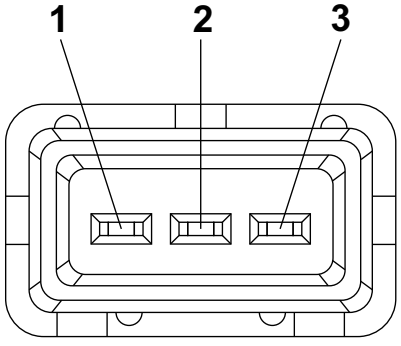
FLANGED SPEED SENSOR

SSF



Connector type

3 pin AMP Junior Timer

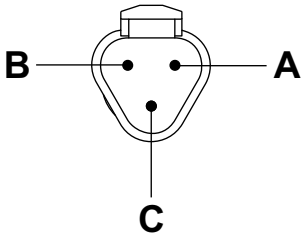


Pin	Function
1	Power supply / V DC
2	Signal
3	Ground

Mating Connector: 282191-1 (TE Internal Number)

Connector type

3 pin Deutsch DT04-3P - Secondary Lock W3P



Pin	Function
A	Power supply / V DC
B	Signal
C	Ground

Mating Connector: DT06-3S with secondary lock W3S

06/12.2022

INTEGRATED SPEED SENSOR SSI

Electrical characteristics

Power supply	8 ÷ 30 V DC
Operating temperature	-40 ÷ 100 °C (-40 ÷ 212 °F)
Output signal	Open Collector outout, without pull-up resistor.
Duty cycle	50 % ±10%
Current load	< 40 mA
Short circuit protection	Output against ground. Output against Vbb
Reverse polarity protection	Power supply lines

EMC protection

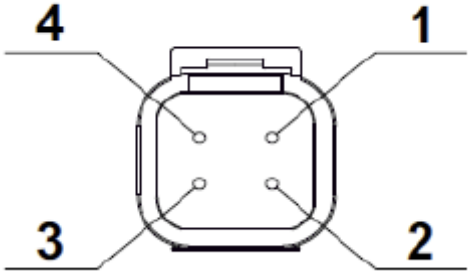
Radiated immunity	Reference standards: ISO 11452-2 • Frequency range: 200 MHz ÷ 2 GHz • Test level: 100 V/m
Conducted immunity	Reference standards: ISO 11452-4 • Frequency range: 20 MHz ÷ 220 MHz • Test level: 100 mA
Load dump protection	Reference standards: ISO 7637-2 • Test level: 100 V
Electrostatic discharge	Reference standards: ISO 10605 • ±4, ±6,±8 kV Contact discharge • ±4, ±6,±8 kV, ±15 kV Air discharge

Environmental resistance

Random noise	Reference standards: EN 60068-2-64 • a= 0,1 g^2 (RMS 3.3 g) • f= 10 ÷ 1000 Hz • Duration per axis (xyz): 8 h
Shock	Reference standards: EN 60068-2-29 • Type of shock: Half sine • Acceleration amplitude: = 40 g • Shock duration: 6 ms • 100 positive shocks for each axes • 100 negative shocks for each axes
IP67 Protection	Reference standards: EN 60529
IP6K9 Protection	Reference standards: ISO 20653
Temperature cycle test	Reference standards: IEC 60068-2-14 • Temperature: -40 ÷ 100 °C (-40 ÷ 212 °F) • Number of cycles: 30
Temperature shock test	Reference standards: EN 60068-2-14 • 60 min @ -40 °C (-40 °F) air > 20 min @ 100 °C (212 °F) • Number of cycles: 20
Low temperature test	Reference standards: ISO 16750-4 •Temperature: -40 °C (-40 °F) • Test duration: 24 h
High temperature test	Reference standards: ISO 16750-4 • Temperature: 100 °C (212 °F) • Test duration: 48 h

Connector type

4 pin DTM04-A4P - Secondary lockWM-4P



Pin	Function
1	Power supply / V DC
2	Signal
3	Ground

Mating Connector: 282191-1 (TE Internal Number)

06/12.2022

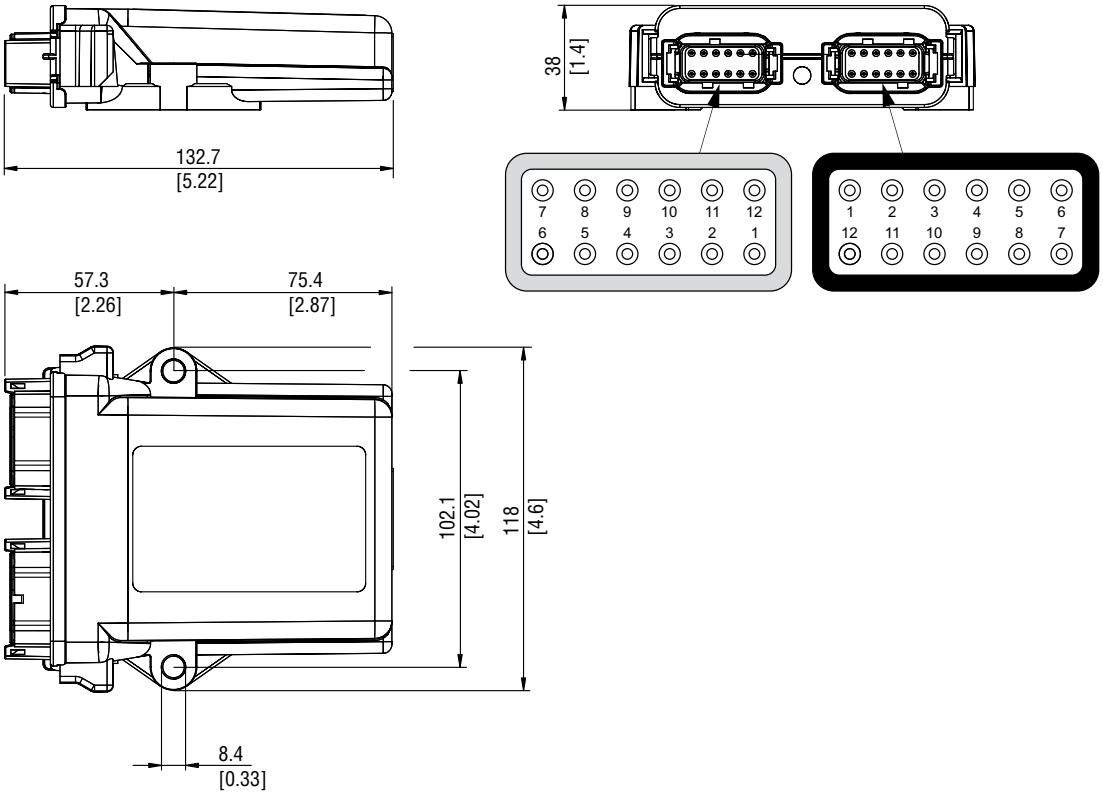
ELECTRONIC CONTROL UNIT FOR FAN DRIVE SYSTEM

The electronic control unit controls the speed of the fan drive system by controlling the proportional relief valve and allows to change the direction of rotation by controlling the reverse valve. Electronic control unit can also receive CAN SAE J1939 standard messages. The temperature signals available on CAN bus (Engine Coolant Temperature, Engine Intercooler Temperature, Ambient Air Temperature, Intake Manifold Temperature) can be used to control the fan drive system. Retarder and Reverse command can also be provided through the CAN BUS system.

Input / Output	ECS200	ECS300
Analog input	6	4
Temperature sensor input	2	4
Digital/Frequency input	3	3
CAN BUS	1	2
Bluetooth	No	Yes
Proportional output	2 High Side drive 2A 2 Low Side drive 2A with current feedback	3 High Side drive 2A 3 Low Side drive 2A with current feedback

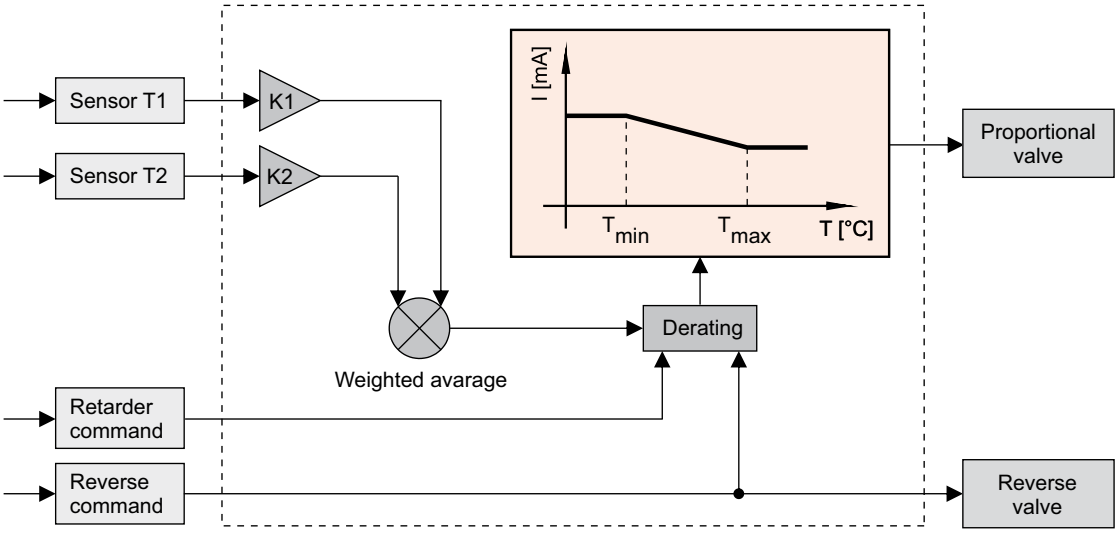
For normally closed electro-hydraulic valves, the control logic is:

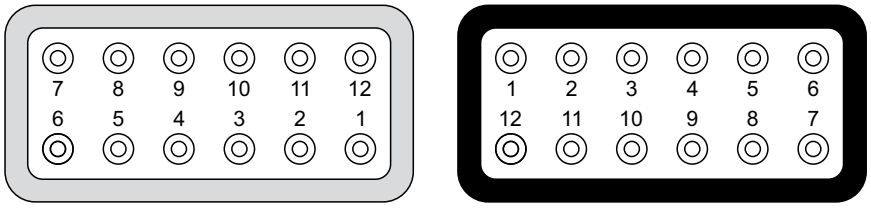
Low temperature	Intermediate temperature	High temperature	Error/Failure
< Tmin	Between Tmin - Tmax	> Tmax	
Output current is maximum	Output current changes linearly from maximum to minmum	Output current is minimum	Output current is null
Fan speed is minimum		Fan speed is maximum	Fan speed run to maximum



05/02.2018

ELECTRONIC CONTROL UNIT FOR FAN DRIVE SYSTEM ECS200





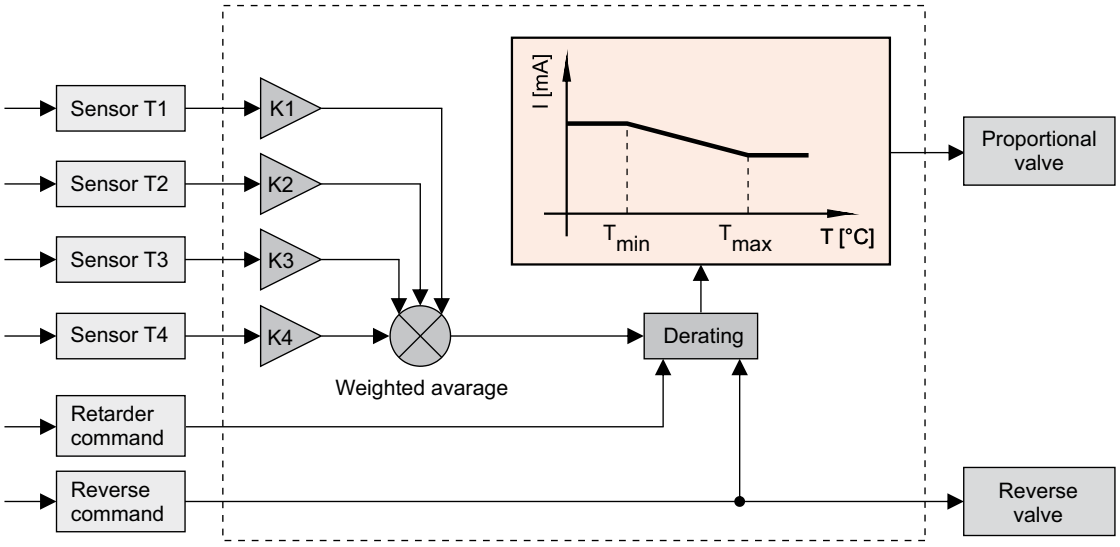
Pinout

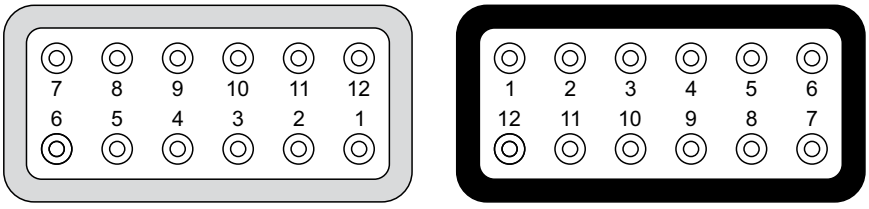
Grey connector	
Pin	Function
1	Temperature sensor GND
2	CAN1 HIGH
3	CAN1 LOW
4	Speed sensor input
5	Digital input n. 3 Reverse
6	Digital input n. 2 Retarder
7	Proportional valve +
8	Proportional valve -
9	Reverse valve +
10	Reverse valve -
11	N.C.
12	N.C.

Black connector	
Pin	Function
1	N.C.
2	N.C.
3	N.C.
4	N.C.
5	N.C.
6	N.C.
7	Temperature sensor T 2
8	Temperature sensor T 1
9	N.C.
10	N.C.
11	Power GND - CAN GND
12	Power VBB

05/02.2018

ELECTRONIC CONTROL UNIT FOR FAN DRIVE SYSTEM ECS300





Pinout

Grey connector	
Pin	Function
1	Temperature sensor GND
2	CAN1 HIGH
3	CAN1 LOW
4	Speed sensor input
5	Digital input n. 3 Reverse
6	Digital input n. 2 Retarder
7	Proportional valve +
8	Proportional valve -
9	Reverse valve +
10	Reverse valve -
11	Diagnostic Lamp +
12	N.C.

Black connector	
Pin	Function
1	CAN2 HIGH
2	CAN2 LOW
3	Temperature sensor T 3
4	N.C.
5	N.C.
6	Temperature sensor T 4
7	Temperature sensor T 2
8	Temperature sensor T 1
9	N.C.
10	N.C.
11	Power GND - CAN GND Diagnostic Lamp GND
12	Power VBB

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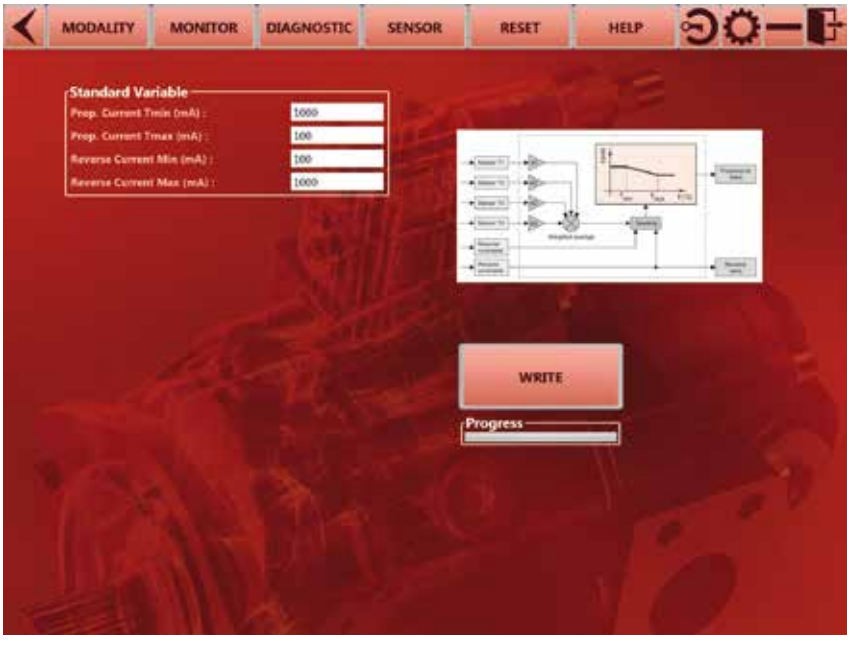
CASAPPA SERVICE TOOL SOFTWARE

KEY FEATURES

- Parametrization of ECS200 / ECS300 control units
- Monitor and diagnostic functions
- Auto detection of the different type of control unit

KEY FEATURES

Connection through Bluetooth or CAN BUS interface.



MODALITY: CONTROL

Read and change software parameter.

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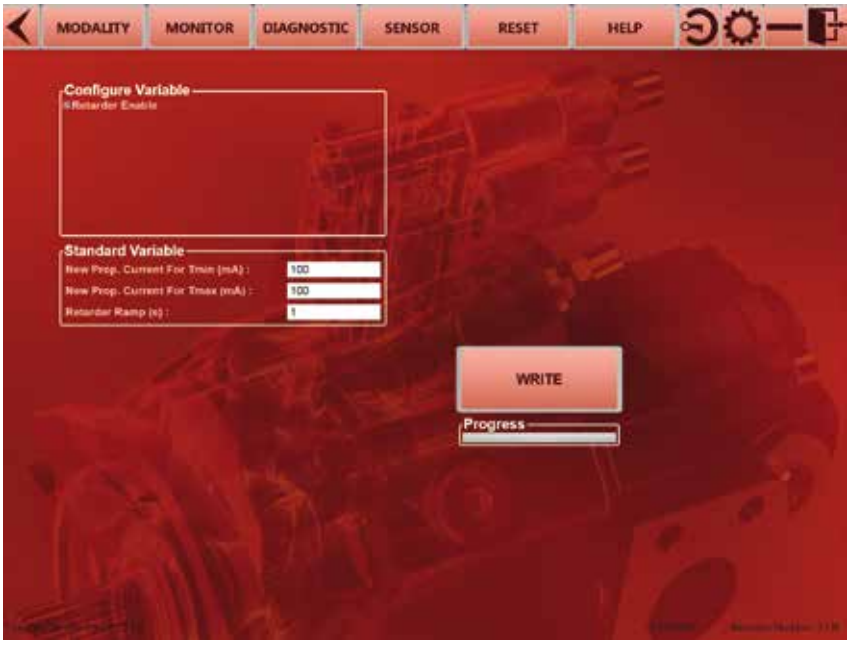
CASAPPA SERVICE TOOL SOFTWARE



MODALITY: RETARDER

Retarder function allows to increase or decrease the hydraulic motor speed changing the control current of proportional valve according configurable logics.

MODALITY: REVERSE

Reverse function is available only for reversible motor with reverse valve and allows to change the direction of rotation for cleaning cycles of radiators.
The engaging modality can be done in various way: manually from the operator “On Command”, on system start-up “At Reset” or at programmed interval times “On Timeout”.
During the cleaning cycles, fan speed can be controlled setting the limit of proportional valve control current “Currents – Proportional min/max”.
Phase time of cleaning cycles can be adjusted to the system requirements “Cycle Control – Phase Time”

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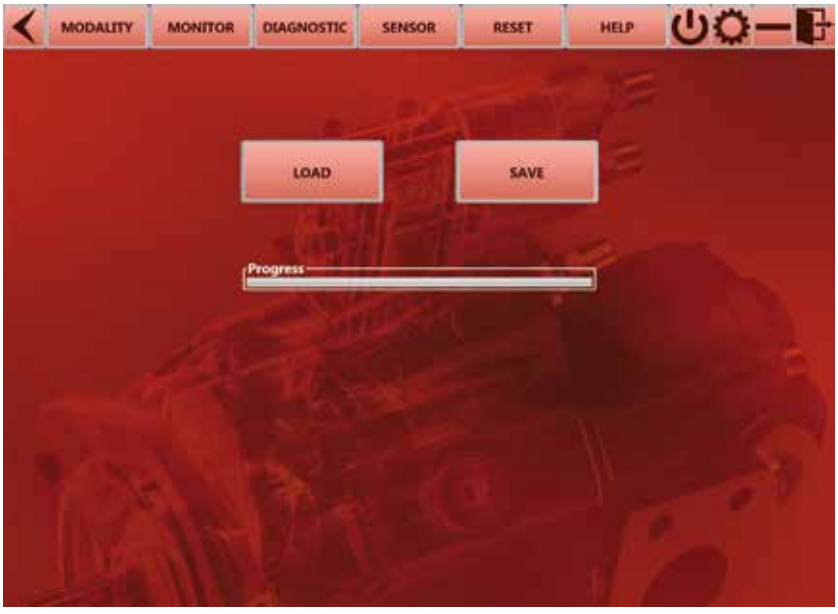
CASAPPA SERVICE TOOL SOFTWARE

SENSORS

The electronic control unit provides from a minimum of 1 to a maximum of 4 temperature sensors.
In case of supply current failure the fan runs to maximum speed. Minimum and maximum limit of control current can be customized according to the technical data of proportional valve.
For general information and dimensions about the physical temperature sensors refer to the electronic control devices technical catalogue.



CONFIGURATION

Save/store control unit parameters configuration to/from file.
Reset control unit parameters configuration to factory defaults.

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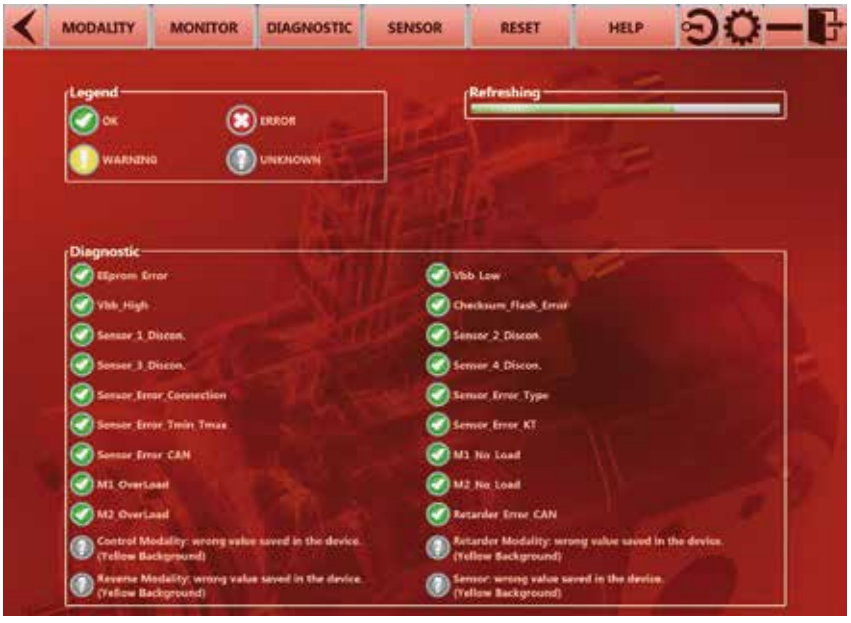
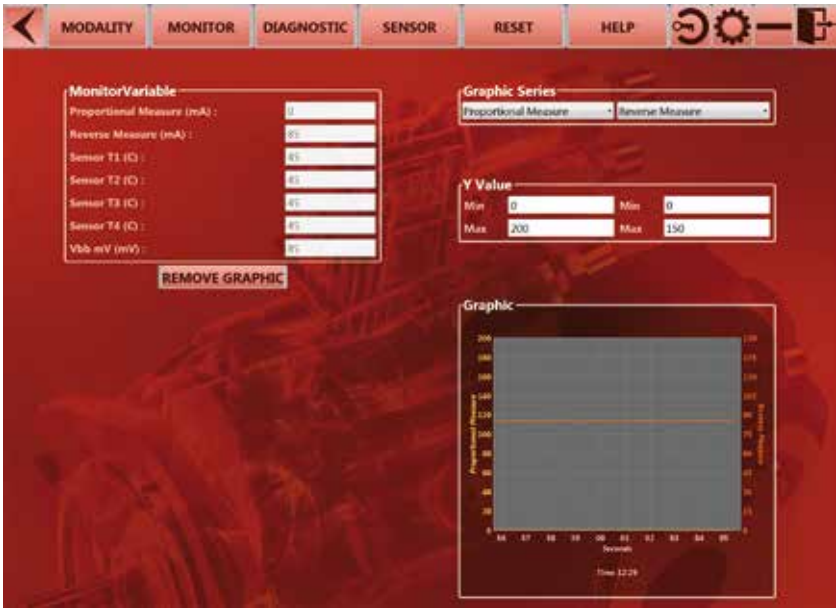
CASAPPA SERVICE TOOL SOFTWARE



DIAGNOSTIC
Real-time monitoring of control unit error messages.



MONITOR
Graphical view of the measured variables over time."

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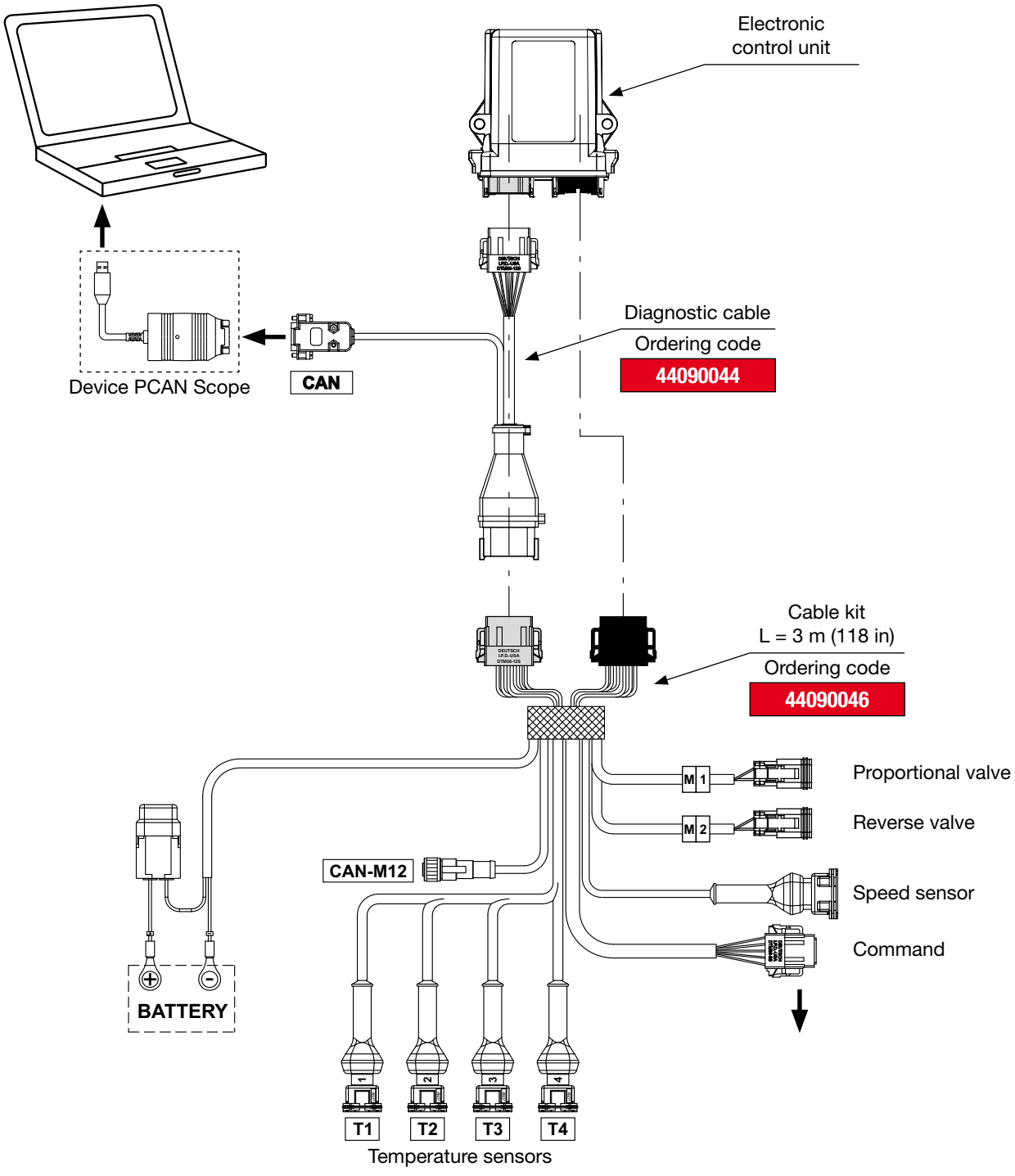
CABLE KIT



05/02.2018

Command connector pinout

Pin	Function
1	Digital input n. 3 Reverse
2	Digital input n. 2 Retarder
3	Power GND - CAN GND
4	N.C.

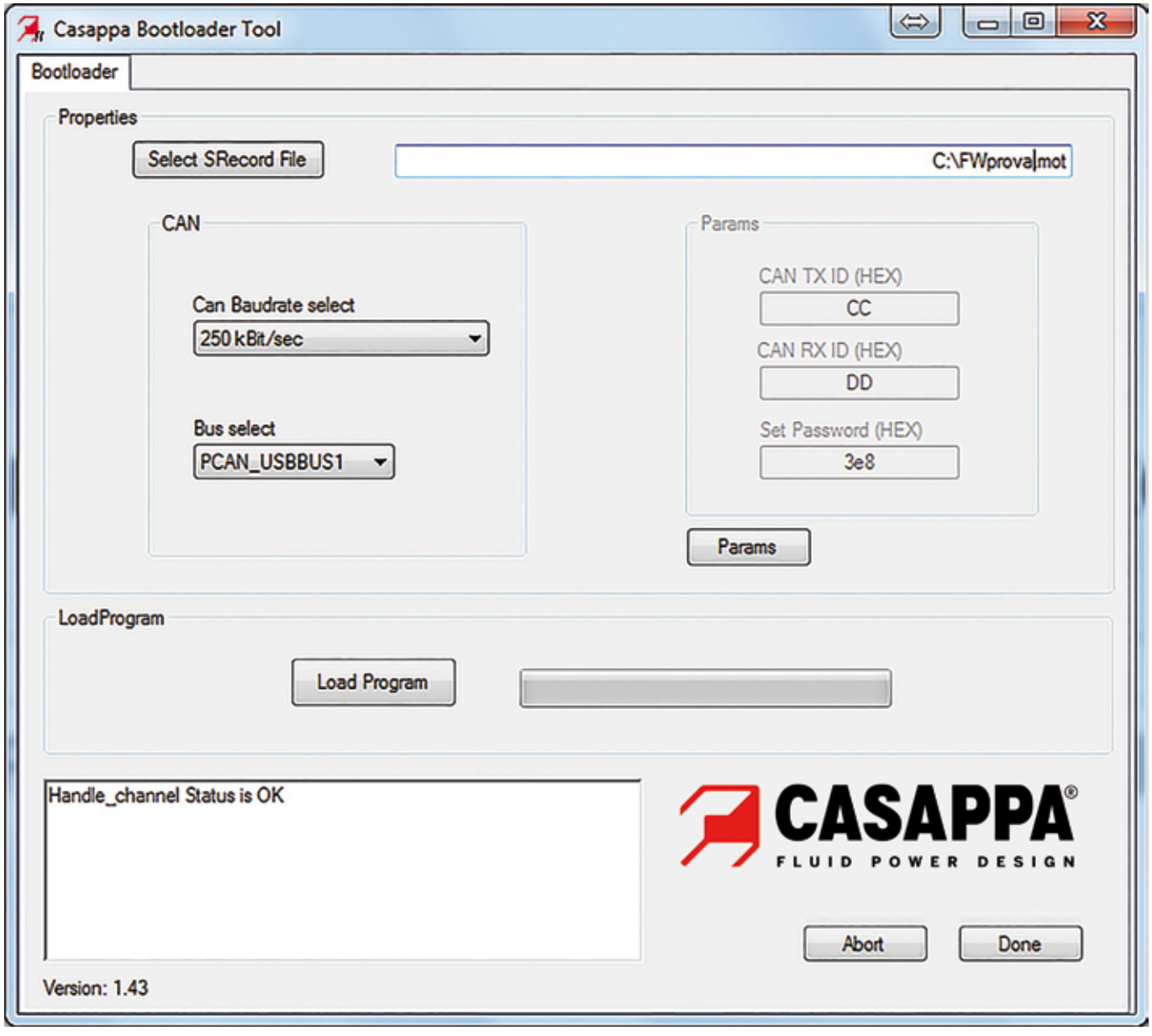
Pin	Function
5	N.C.
6	N.C.
7	N.C.
8	N.C.

CASAPPA BOOTLOADER TOOL AND DIAGNOSTIC CABLE

The software allows remote electronic control unit programming through CAN interface (device PCAN scope).

KEY FEATURES

- Direct file selection and loading
- CAN Baudrate selection
- One-Click reprogramming procedure



06/12.2022

CONNECTORS KIT

Female connector DTM06-12SA

Kit include female connector, female contacts and seals

Ordering code

44090140

Technical data

Operating temperature	-40 ÷ 125 °C (-40 ÷ 257 °F)
Number of ways	12
Protection	IP68

Female connector DTM06-12SB

Kit include female connector, female contacts and seals

Ordering code

44090145

Technical data

Operating temperature	-40 ÷ 125 °C (-40 ÷ 257 °F)
Number of ways	12
Protection	IP68

Female connector JR Power Timer

Kit include female connector, female contacts and seals

Ordering code

44090163

Technical data

Operating temperature	-30 ÷ 125 °C (-22 ÷ 257 °F)
Number of ways	2
Wire size	18 - 22 AWG
Current rating	20 A
Voltage, max	250 V DC
Protection	IP65

Female connector DIN type

Ordering code

05101206

Technical data

Operating temperature	-40 ÷ 90 °C (-40 ÷ 194 °F)
Number of ways	3
Wire size	18 - 22 AWG
Current rating	16 A
Voltage, max	250 V AC / 300 V DC
Protection	IP65
Thread size	PG11

Female connector DT06-2S

Kit include female connector, female contacts and seals

Ordering code

RCON0016

Technical data

Operating temperature	-55 ÷ 125 °C (-67 ÷ 257 °F)
Number of ways	2
Wire size	14 - 22 AWG
Current rating	13 A
Voltage, max	250 V DC
Protection	IP67

AIR/FLUID TEMPERATURE SENSOR

Application: Temperature measurement of cooling fluids, hydraulic oils, engine oil or ambient temperature in mobile machines.

Ordering code

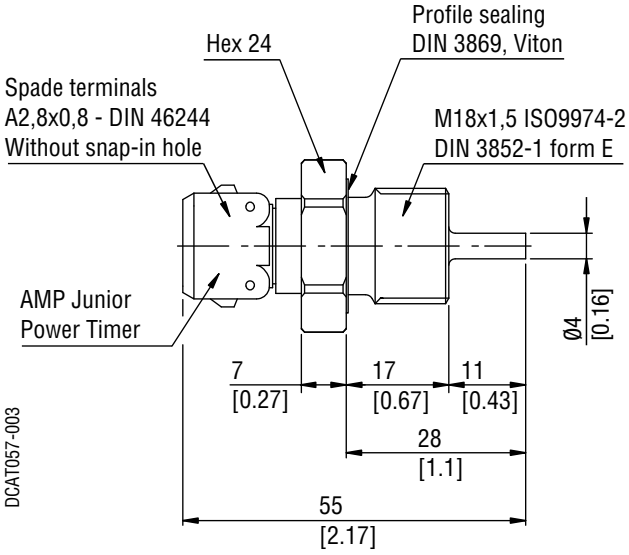
44090146

Electrical characteristics

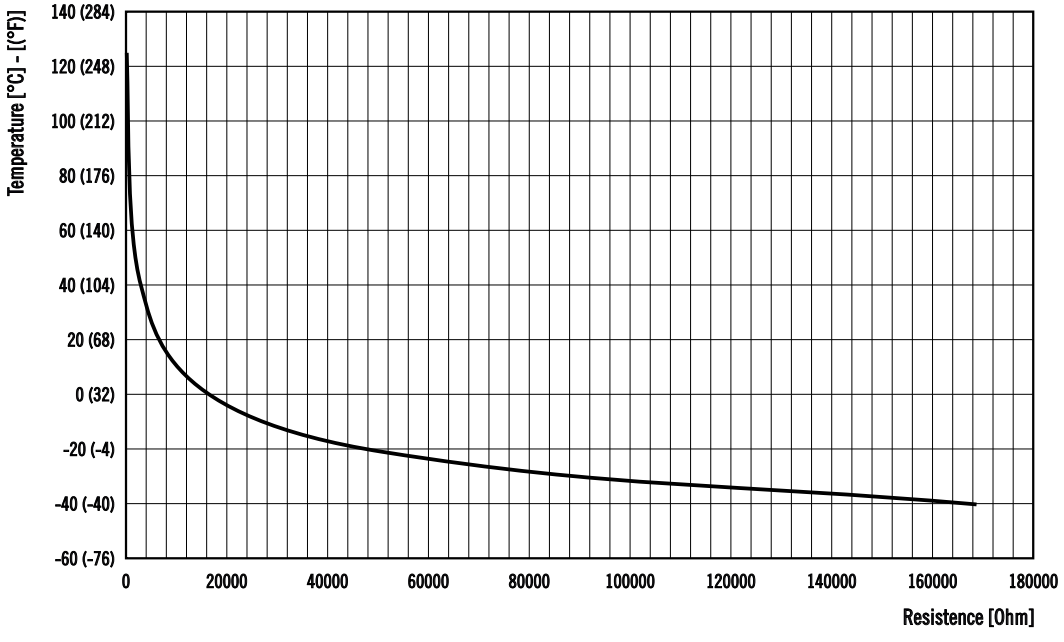
Type	Thermistor
Resistive element	NTC
Resistance	500 Ohm at 25 °C (77 °F) 16325 Ohm at 0 °C (32 °F)
Connector	Amp Junior Power Timer

Environmental characteristics

Operating temperature	-40 ÷ 150 °C (-40 ÷ 302 °F)
Ingress protection	IP67 with mating connector mounted



Curve Resistance/Temperature NTC sensor



06/12.2022

GEAR MOTORS FOR FAN DRIVE SYSTEM

Replaces: 05/02.2018

POLARIS®

Gear motors built in three pieces with an extruded body in high resistance aluminium alloy.

DISPLACEMENTS
(available in group 20)
From 4,95 cm^3/rev (0.30 in^3/rev)
To 33,03 cm^3/rev (2.01 in^3/rev)

PRESSURE
Max. peak pressure up to 250 bar (3600 psi)

SPEED
Max. speed up to 4000 min^{-1}

CAST IRON BODY PH POLARIS PH

Gear motors built in three pieces with cast iron body. The new gear motors “PH” series is an evolution of the “POLARIS” series.

DISPLACEMENTS
From 8,26 cm^3/rev (0.50 in^3/rev)
To 33,03 cm^3/rev (2.01 in^3/rev)

PRESSURE
Max. peak pressure up to 250 bar (3600 psi)

SPEED
Max. speed up to 3500 min^{-1}

KAPPA® Compact

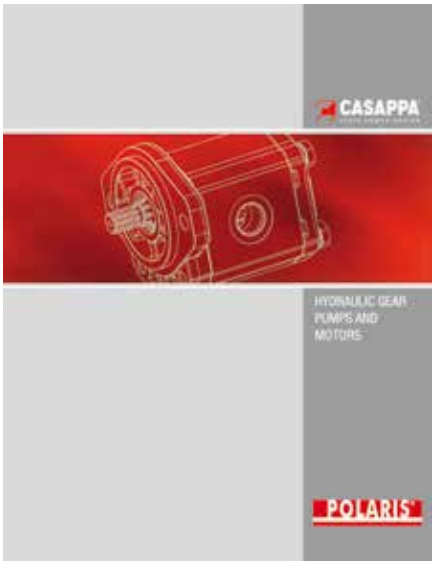
KAPPA 30 Compact series is a solid compact 2-piece construction and allows you to include many functions in a reduced space.

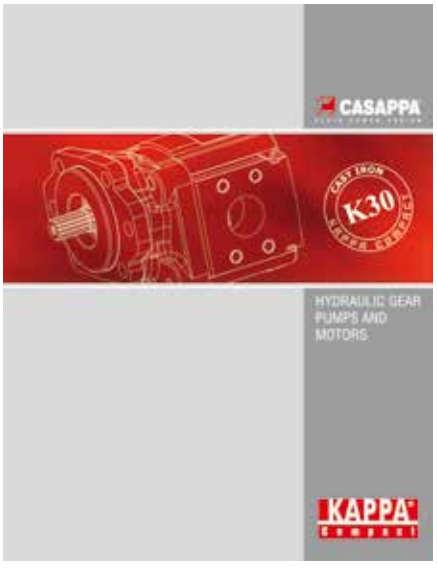
DISPLACEMENTS
From 21,99 cm^3/rev (1.34 in^3/rev)
To 56,54 cm^3/rev (3.45 in^3/rev)

PRESSURE
Max. peak pressure up to 250 bar (3600 psi)

SPEED
Max. speed up to 3000 min^{-1}

Displacements, pressures and speed see page 36 ÷ 37.
General data, drive shafts, mounting flanges and ports, refer to the technical catalogues of each specific series.
Kappa Compact additional drive shafts and mounting flanges see page 65.





06/12.2022

GEAR MOTORS - FEATURES

Construction	External gear type motors
Mounting	EUROPEAN - SAE - GERMAN flanges
Line connections	Threaded and flanged
Direction of rotation (looking at the drive shaft)	Reversible external drain **L** - **R** (#) **O**
Max drain line pressure on reversible rotation motors	5 bar (73 psi) continuous @ min. speed (see pages 36 ÷ 37)
	1 bar (14.5 psi) continuous @ max. speed (see pages 36 ÷ 37)
Max back pressure on in series motors	150 bar (2175 psi)
Fluid temperature range	See table (1)
Fluid	Mineral oil based hydraulic fluids to ISO/DIN and fire resistant fluids [see table (1)]. For other fluids please consult our technical sales department.
Viscosity range	From 12 to 100 mm^2/s (cSt) recommended [60 to 456 SSU]
	Up to 750 mm^2/s (cSt) permitted [3410 SSU]
Recommended filtration	See table (2)

(#) Only for Kappa 30 HSC

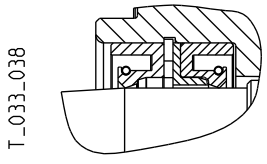
Replaces: 05/02.2018

Tab. 1

Type	Fluid composition	Max pressure bar (psi)	Max speed min^{-1}	Temperature °C (°F)			Seals (●)	Shaft seals option (◆)
				Min	Max continuous	Max peak		
ISO/DIN	Mineral oil based hydraulic fluid to ISO/DIN	See pages 36÷37	See pages 36÷37	-25 (-13)	80 (176)	100 (212)	**N**	**D**
				-25 (-13)	110 (230)	125 (257)	**T-PV**	

(●) **N**= Buna NBR (standard) - **T-PV**= Hydrogenated buna HNBR seals with Viton-FKM shaft seals

D (◆) Shaft seal with wiper seal



Max drain line pressure

Max continuous pressure at min speed: 5 bar (73 psi)
Max continuous pressure at max speed: 1 bar (14,5 psi)

Tab. 2

Working pressure bar (psi)	Δp < 140 (2030)	140 < Δp < 210 (2030) (3045)	Δp > 210 (3045)
Contamination class NAS 1638	10	9	8
Contamination class ISO 4406:1999	21/19/16	20/18/15	19/17/14
Achieved with filter $ß_{10}$ (c) ≥ 75 according to ISO 16889	-	10 µm	10 µm
Achieved with filter $ß_{25}$ (c) ≥ 200 according to ISO 16889	25 µm	-	-

Please contact us for more information

Casappa recommends to use its own production filters:

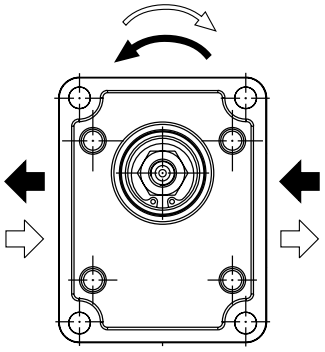
IKRON® Fluid Filtration

O 06/12.2022

GEAR MOTORS - FEATURES

DEFINITION OF ROTATION DIRECTION LOOKING AT THE DRIVE SHAFT

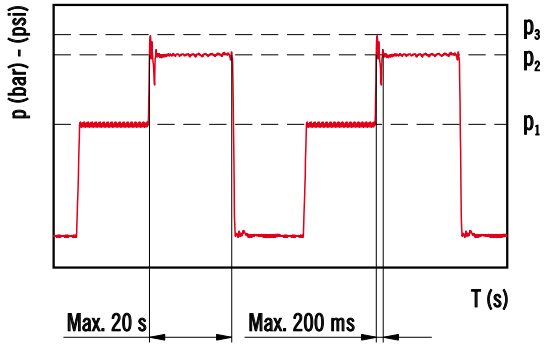
Reversible motors with built-in valve can rotate in one direction only.



Reversible rotation

Ordering code	
CRD	Clockwise rotation
CRS	Anti-clockwise rotation

PRESSURE DEFINITION



p_1 Constant operating pressure
p_2 System pressure (relief valve setting)
p_3 Peak of pressure

The peak of pressure is the max pressure allowed and it corresponds to the overshoot of the relief valve.

Please note that both relief valve setting and overshoot must be lower than their limits.
If the relief setting is compliant but the overshoot is higher than the limit, the relief setting must be decreased until the overshoot is compliant to Casappa limit.

Please contact us for high frequency applications.

05/02.2018

POLARIS 20 GEAR MOTORS - FEATURES

Motor type	Displacement	Max. pressure			Max. speed	Min. speed
		p_1	p_2	p_3		
	cm^3/rev (in^3/rev)	bar (psi)			min^{-1}	
PLM 20•4	4,95 (0.30)	250 (3625)	250 (3625)	250 (3625)	4000	600
PLM 20•6,3	6,61 (0.40)	250 (3625)	250 (3625)	250 (3625)	4000	600
PLM 20•7,2	7,29 (0.44)	250 (3625)	250 (3625)	250 (3625)	4000	600
PLM 20•8	8,26 (0.50)	250 (3625)	250 (3625)	250 (3625)	3500	600
PLM 20•9	9,17 (0.56)	250 (3625)	250 (3625)	250 (3625)	3500	600
PLM 20•10,5	10,9 (0.66)	250 (3625)	250 (3625)	250 (3625)	3500	600
PLM 20•11,2	11,23 (0.69)	250 (3625)	250 (3625)	250 (3625)	3500	600
PLM 20•14	14,53 (0.89)	250 (3625)	250 (3625)	250 (3625)	3500	500
PLM 20•16	16,85 (1.03)	250 (3625)	250 (3625)	250 (3625)	3000	500
PLM 20•19	19,09 (1.16)	200 (2900)	220 (3190)	240 (3480)	3000	500
PLM 20•20	21,14 (1.29)	200 (2900)	220 (3190)	240 (3480)	3000	500
PLM 20•24,5	24,84 (1.52)	170 (2465)	190 (2755)	210 (3045)	2500	500
PLM 20•25	26,42 (1.61)	170 (2465)	190 (2755)	210 (3045)	2500	500
PLM 20•27,8	28,21 (1.72)	130 (1885)	150 (2175)	170 (2465)	2000	500
PLM 20•31,5	33,03 (2.01)	130 (1885)	150 (2175)	170 (2465)	2000	500

Please contact us for different working conditions.

POLARIS PH GEAR MOTORS - FEATURES

Motor type	Displacement	Max. pressure			Max. speed	Min. speed
		p_1	p_2	p_3		
	cm^3/rev (in^3/rev)	bar (psi)			min^{-1}	
PHM 20•8	8,26 (0.50)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•10.5	10,9 (0.66)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•11.2	11,23 (0.69)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•14	14,53 (0.89)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•16	16,85 (1.03)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•18	18,29 (1.12)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•19	19,09 (1.16)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•20	21,14 (1.29)	250 (3625)	250 (3625)	250 (3625)	3500	500
PHM 20•23	23,32 (1.42)	250 (3625)	250 (3625)	250 (3625)	3000	500
PHM 20•24,5	24,84 (1.52)	230 (3335)	250 (3625)	250 (3625)	3000	500
PHM 20•25	26,42 (1.61)	230 (3335)	250 (3625)	250 (3625)	3000	500
PHM 20•27,8	28,21 (1.72)	200 (2900)	230 (3335)	250 (3625)	2500	500
PHM 20•31,5	33,03 (2.01)	200 (2900)	230 (3335)	250 (3625)	2500	500

Please contact us for different working conditions.

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KAPPA 30 GEAR MOTORS - FEATURES

Motor type	Displacement	Body design	Characteristics	Max. pressure			Max. speed	Min. speed
				p_1	p_2	p_3		
	cm^3/rev (in^3/rev)			bar (psi)			min $^{-1}$	
KM 30•22	21,99 (1.34)	HSC (#)	Compact	250 (3625)	250 (3625)	250 (3625)	3000	350
		HSY / CSZ / CSK	Standard					
KM 30•27	26,7 (1.63)	HSC (#)	Compact	240 (3480)	250 (3625)	250 (3625)	3000	350
		HSY / CSZ / CSK	Standard	250 (3625)				
KM 30•31	30,63 (1.87)	HSC (#)	Compact	220 (3190)	240 (3480)	250 (3625)	3000	350
		HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)			
KM 30•34	34,56 (2.11)	HSC (#)	Compact	210 (3045)	230 (3335)	250 (3625)	3000	350
		HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)			
KM 30•38	39,27 (2.40)	HSC (#)	Compact	210 (3045)	230 (3335)	250 (3625)	3000	350
		HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)			
KM 30•41	41,62 (2.54)	HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)	250 (3625)	3000	350
KM 30•43	43,98 (2.68)	HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)	250 (3625)	3000	350
KM 30•46	46,34 (2.83)	HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)	250 (3625)	3000	350
KM 30•51	51,83 (3.16)	HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)	250 (3625)	2500	350
KM 30•56	56,54 (3.45)	HSY / CSZ / CSK	Standard	250 (3625)	250 (3625)	250 (3625)	2500	350

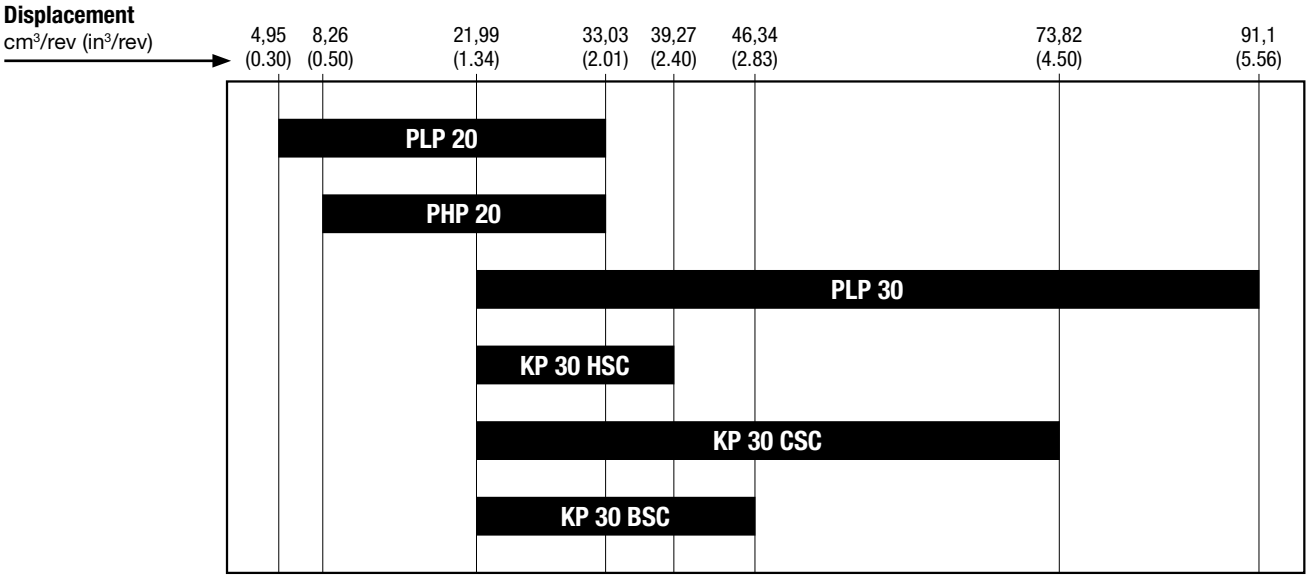
(#) Only with speed sensor without valves. Motor type from 41 to 56 with HSC body design are available on request.
Please contact us for different working conditions.

06/12.2022

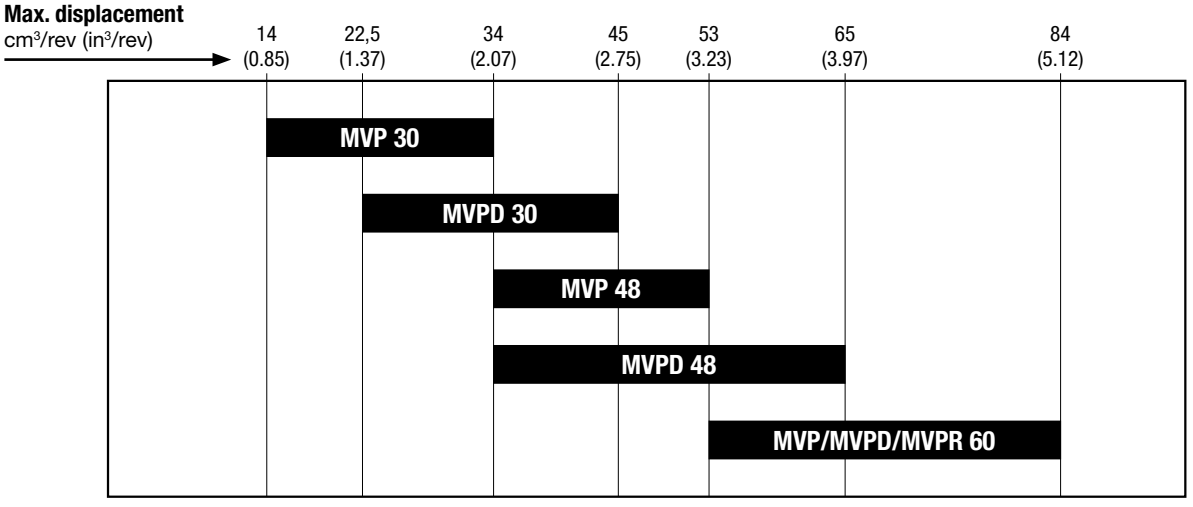
PUMP DISPLACEMENTS CHOICE

SELECTION OF PUMPS TO FEED FAN DRIVE MOTORS

GEAR PUMPS



PISTON PUMPS

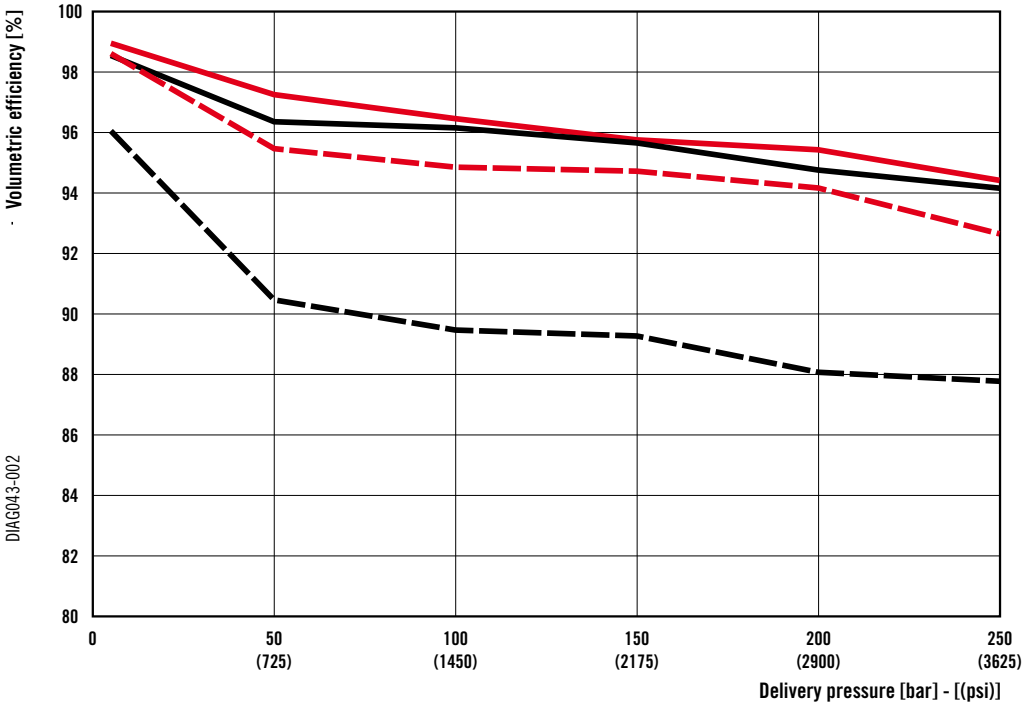


06/12.2022

CAST IRON vs ALUMINIUM MOTORS - PERFORMANCES

VOLUMETRIC EFFICIENCY

Engine speed: 2000 min^{-1}
Oil type: ISO VG46



Aluminium
PLM20 @ 50 °C (122 °F)
PLM20 @ 80 °C (176 °F)

Cast iron
PHM20 @ 50 °C (122 °F)
PHM20 @ 80 °C (176 °F)

The diagram is only for reference.

Max. speed difference between cast iron and aluminium motors up to +15% therefore pump displacement can be reduced

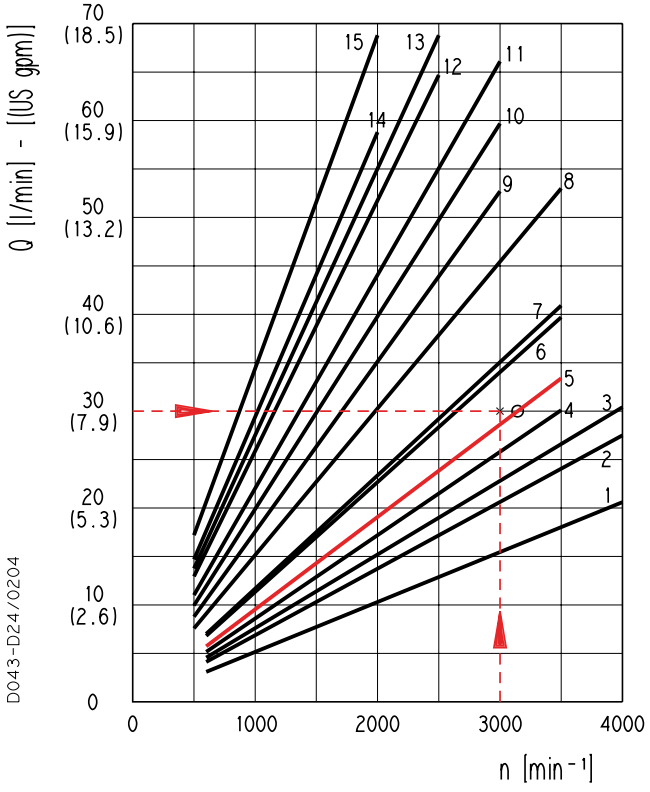
05/02.2018

POLARIS 20 - GEAR MOTOR SIZING EXAMPLE

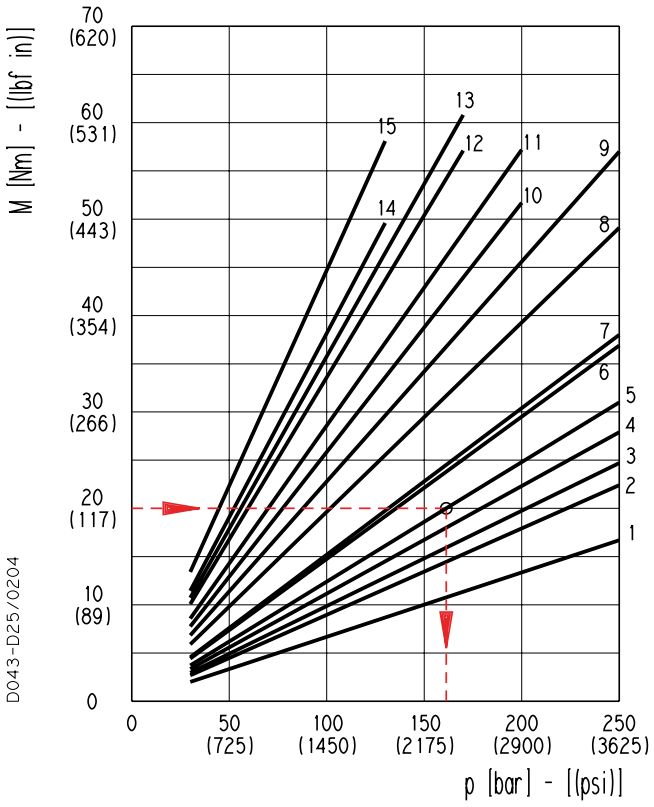
In the cooling system, the airflow of the fan needed to dissipate the heat produced by the system is proportional to speed rotation. The fan absorbed torque is proportional to squared speed, to fan dimensions and to the loss of power that the air encounters while flowing through the radiator.
To make sure that the cooling system is correctly sized is necessary to know the following input parameters:

- Maximum fan speed
- Maximum fan absorbed torque
- Hydraulic system oil flow rate
- Maximum system pressure

FLOW/SPEED CURVES **(1)**



TORQUE/PRESSURE CURVES **(2)**



Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 168 SSU (36 cSt) at 40 °C (104 °F) and at these pressures.

Example	
Hydraulic system oil flow	30 l/min (7.9 US gpm)
Maximum system pressure	200 bar (2900 psi)
Maximum fan speed	3000 min^{-1}
Maximum fan absorbed torque	20 Nm (117 lbf in)

1	**PLM 20•4**	250 bar (3265 psi)
2	**PLM 20•6,3**	250 bar (3265 psi)
3	**PLM 20•7,2**	250 bar (3265 psi)
4	**PLM 20•8**	250 bar (3265 psi)
5	**PLM 20•9**	250 bar (3265 psi)
6	**PLM 20•10,5**	250 bar (3265 psi)
7	**PLM 20•11,2**	250 bar (3265 psi)
8	**PLM 20•14**	250 bar (3265 psi)

9	**PLM 20•16**	250 bar (3265 psi)
10	**PLM 20•19**	200 bar (2900 psi)
11	**PLM 20•20**	200 bar (2900 psi)
12	**PLM 20•24,5**	170 bar (2465 psi)
13	**PLM 20•25**	170 bar (2465 psi)
14	**PLM 20•27,8**	130 bar (1885 psi)
15	**PLM 20•31,5**	130 bar (1885 psi)

05/02.2018

On graph (1) locate the system flowrate 30 l/min (7.9 US gpm) on Y axis and the speed rate 3000 min^{-1} on X axis to find the hydraulic motor displacement. Select the displacement line that is nearest to the intersection of X and Y axis previously traced out.
In this example the best selection is PLM 20•9 (line 5).
On graph (2) locate the fan absorbed torque rate 20 Nm (177 lbf in) on Y axis and trace a horizontal line to the right until encountering the line 5 previously selected from graph (1) and descend vertically to find the working pressure of the motor. In this case the pressure of 160 bar (2320 psi) is an acceptable value because the maximum allowable pressure of 200 bar (2900 psi) was not exceeded.

OUTOARD BEARING OPTIONS

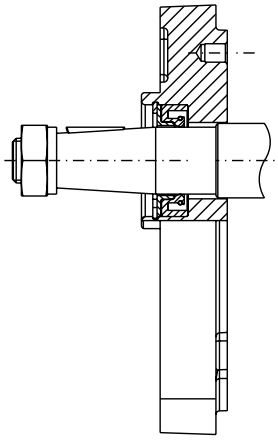
The fan stresses the hydraulic motor shaft with a combination of loads.

- Constant radial load due to the fan mass
- Variable axial load according to fan speed

Replaces: 05/02.2018

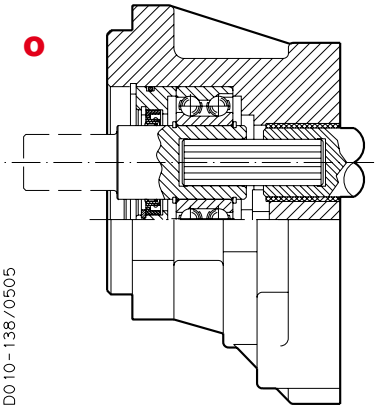
VERSION 0

For applications without radial and axial load on the drive shaft.
Availability: Polaris, Polaris PH and Kappa 30.



VERSION 3

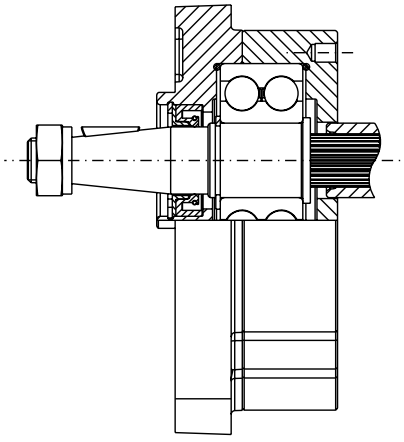
For applications with radial and axial load on the drive shaft.
Availability: Kappa 30



Max. torque version 3:
KAPPA 30: 170 Nm (1505 lbf in)

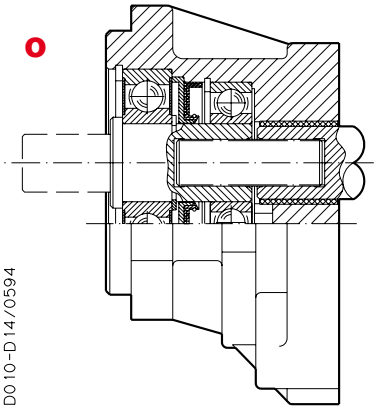
VERSION 5

For applications with radial and axial load on the drive shaft.
Availability: Polaris and Polaris PH



VERSION 6

For applications with radial and axial load on the drive shaft.
Availability: Kappa 30



Max. torque version 6:
KAPPA 30: 170 Nm (1505 lbf in)

o 06/12.2022

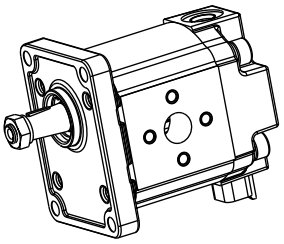
For the outboard bearing life expectancy, refer to the respective technical catalogues.

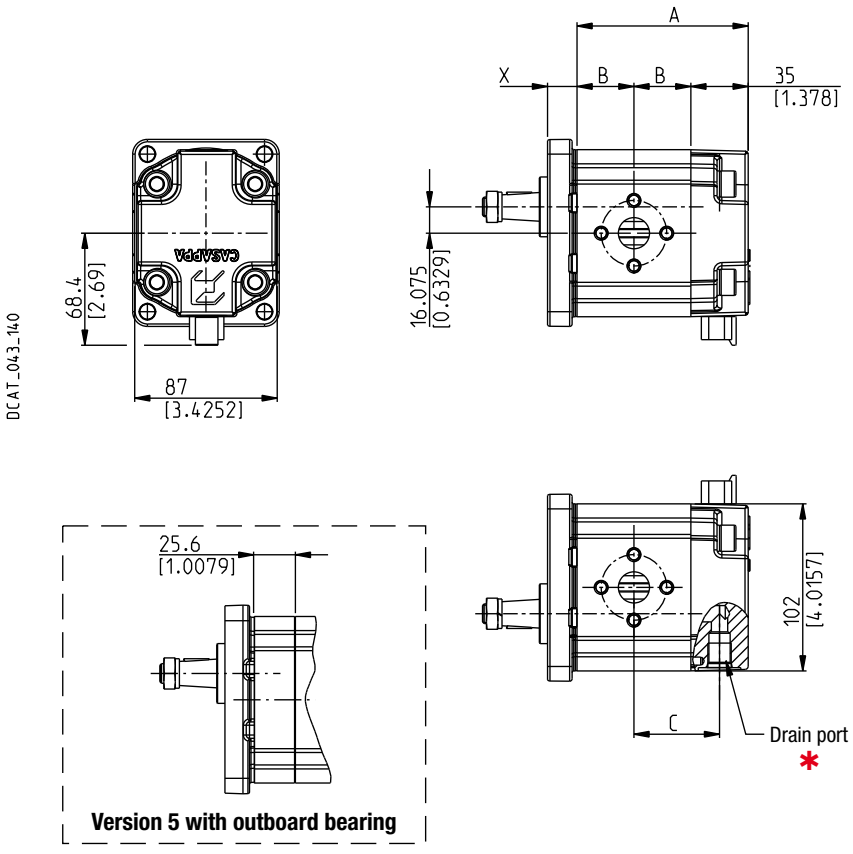
Customized evaluations for applications with outboard bearing are available.
Please contact us for more information.

POLARIS 20 INTEGRATED SPEED SENSOR - GEAR MOTOR DIMENSIONS SSI

Configuration shown:
Reversible rotation L with side drain port

Valve availability: see page 18.
Please contact us for ordering information





X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

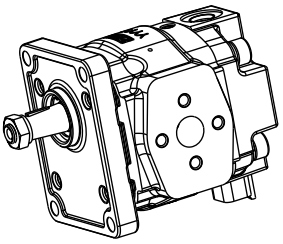
Motor type	A	B	C
	mm (in)	mm (in)	mm (in)
PLM 20•4	86,5 (3.4055)	25,75 (1.0138)	43,25 (1.7028)
PLM 20•6,3	89 (3.5039)	27 (1.0630)	44,5 (1.7520)
PLM 20•7,2	90 (3.5445)	27,5 (1.083)	45 (1.7722)
PLM 20•8	91,5 (3.6024)	28,25 (1.1122)	45,75 (1.8012)
PLM 20•9	92,8 (3.6535)	28,9 (1.1378)	46,4 (1.8268)
PLM 20•10,5	95,5 (3.7598)	30,25 (1.1909)	47,75 (1.8799)
PLM 20•11,2	96 (3.7795)	30,5 (1.2008)	48 (1.8898)
PLM 20•14	101 (3.9764)	33 (1.2992)	50,5 (1.9882)
PLM 20•16	104,5 (4.1142)	34,75 (1.3681)	52,25 (2.0571)
PLM 20•19	107,9 (4.2480)	36,45 (1.4350)	53,9 (2.12)
PLM 20•20	111 (4.3701)	38 (1.4961)	55,5 (2.1850)
PLM 20•24,5	116,6 (4.5905)	40,8 (1.6063)	58,3 (2.2953)
PLM 20•25	119 (4.6850)	42 (1.6535)	59,5 (2.3425)
PLM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	60,85 (2.3957)
PLM 20•31,5	129 (5.0787)	47 (1.8504)	64,5 (2.5394)

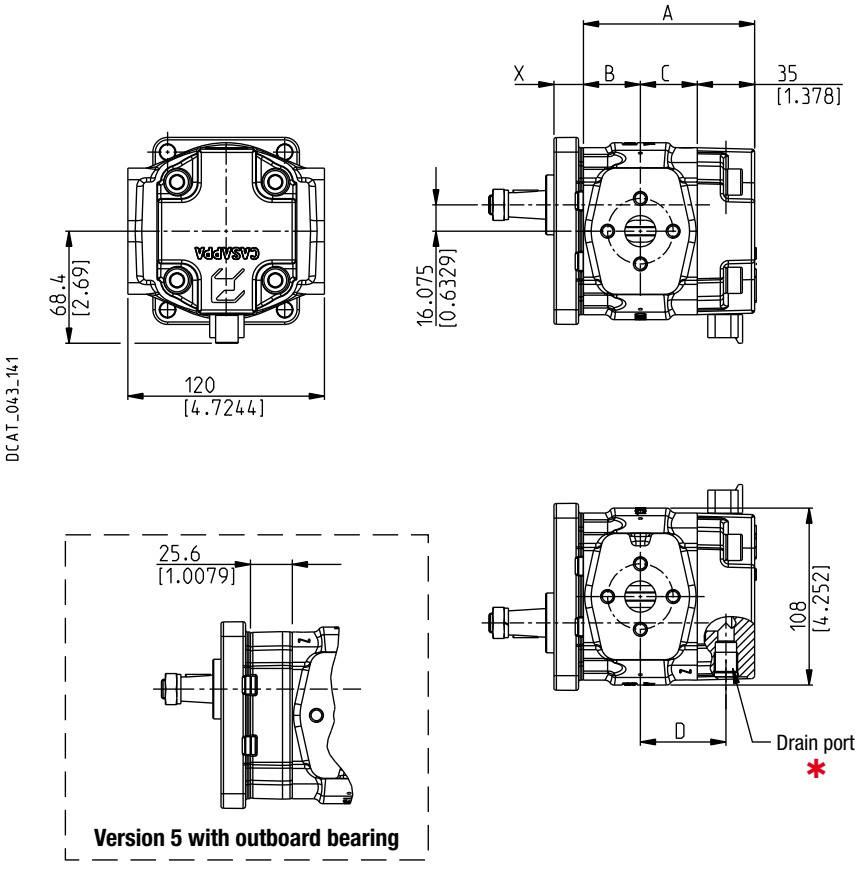
06/12.2022

POLARIS PH INTEGRATED SPEED SENSOR - GEAR MOTOR DIMENSIONS SSI

Configuration shown:
Reversible rotation L with side drain port position

Valve availability: see page 18.
Please contact us for ordering information





X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

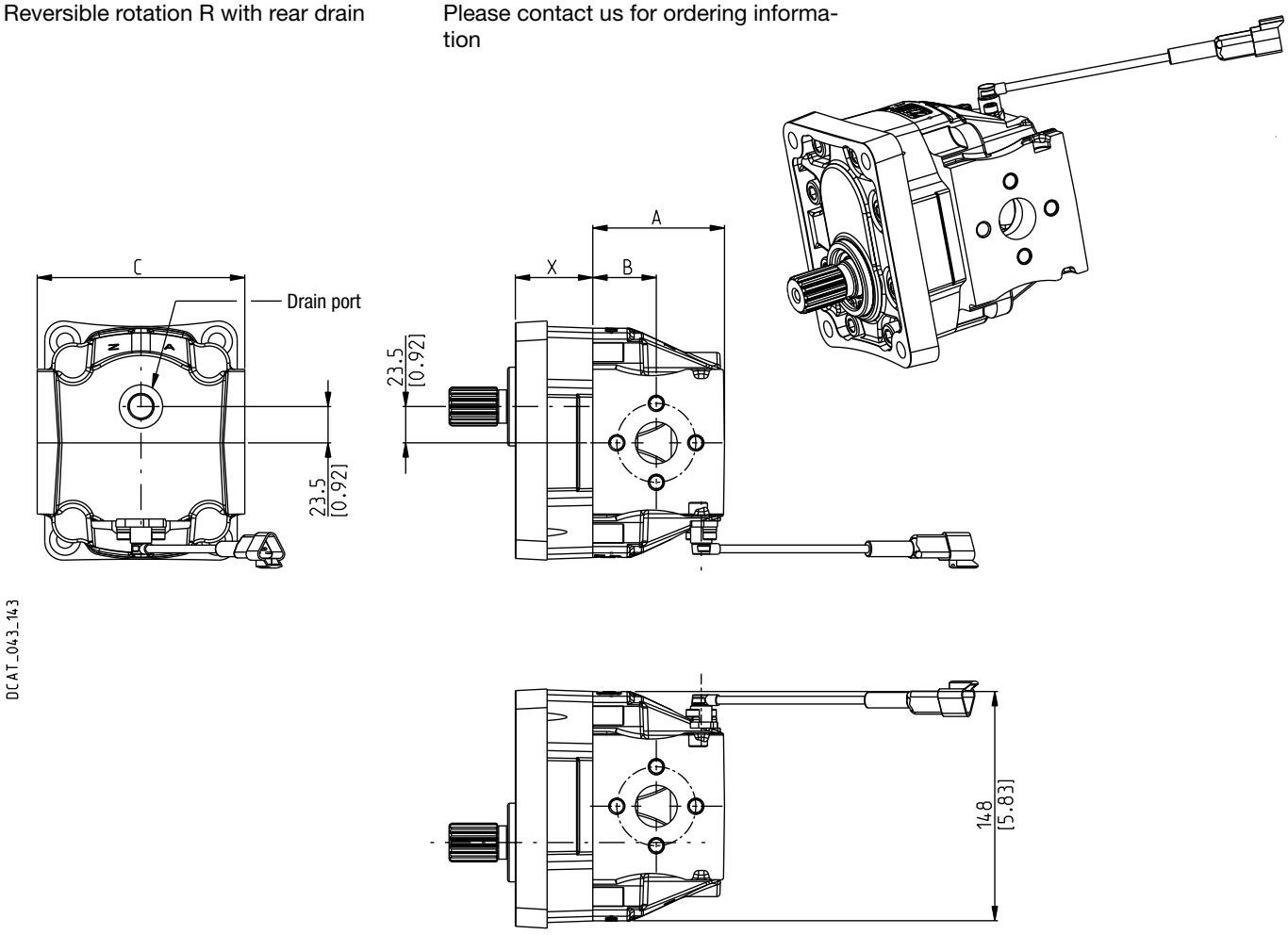
Motor type	A	B	C	D
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PHM 20•8	91,5 (3.6024)	32,5 (1.2795)	24 (0.9449)	41,5 (1.6339)
PHM 20•10,5	95,5 (3.7598)	36,5 (1.4370)	24 (0.9449)	41,5 (1.6339)
PHM 20•11,2	96 (3.7795)	37 (1.4567)	24 (0.9449)	41,5 (1.6339)
PHM 20•14	101 (3.9764)	42 (1.6535)	24 (0.9449)	41,5 (1.6339)
PHM 20•16	104,5 (4.1142)	34,75 (1.3681)	34,75 (1.3681)	52,25 (2.0571)
PHM 20•18	106,7 (4.2008)	35,85 (1.4114)	35,85 (1.4114)	53,35 (2.1004)
PHM 20•19	107,9 (4.2480)	36,45 (1.4350)	36,45 (1.4350)	53,95 (2.1240)
PHM 20•20	111 (4.3701)	38 (1.4961)	38 (1.4961)	55,5 (2.1850)
PHM 20•23	114,3 (4.5000)	39,65 (1.5610)	39,65 (1.5610)	57,15 (2.2500)
PHM 20•24,5	116,6 (4.5905)	40,8 (1.6063)	40,8 (1.6063)	58,3 (2.2953)
PHM 20•25	119 (4.6850)	42 (1.6535)	42 (1.6535)	59,5 (2.3425)
PHM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	43,35 (1.7067)	60,85 (2.3957)
PHM 20•31,5	129 (5.0787)	47 (1.8504)	47 (1.8504)	64,5 (2.5394)

06/12.2022

KAPPA 30 HSC FLANGED SPEED SENSOR - GEAR MOTOR DIMENSIONS SSF

Configuration shown:
Reversible rotation R with rear drain

Valve availability: see page 18.
Please contact us for ordering information



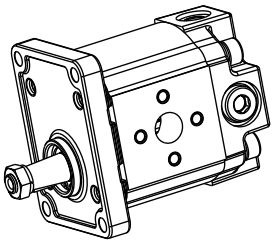
X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue

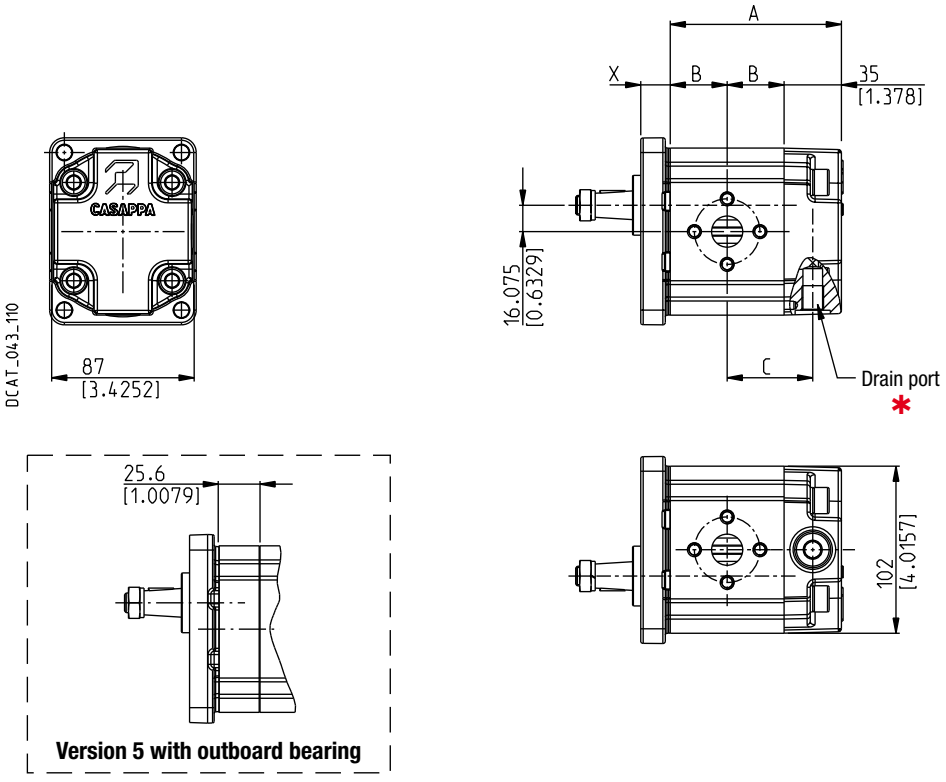
Motor type	A	B	C	
			European - Split ports	Gas - SAE ports
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
KM 30•22	80,5 (3.17)	38 (1.50)	134 (5.28)	142 (5.59)
KM 30•27	83,5 (3.29)	41 (1.61)	134 (5.28)	142 (5.59)
KM 30•31	86 (3.39)	43,5 (1.71)	134 (5.28)	142 (5.59)
KM 30•34	88,5 (3.48)	46 (1.81)	134 (5.28)	142 (5.59)
KM 30•38	88,5 (3.48)	46 (1.81)	134 (5.28)	142 (5.59)

06/12.2022

POLARIS 20 GEAR MOTOR DIMENSIONS V8

Configuration shown:
Clockwise rotation CRD
Anti-cavitation valve





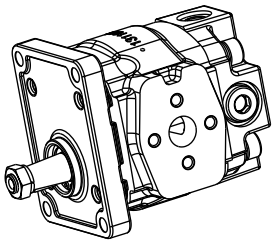
X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

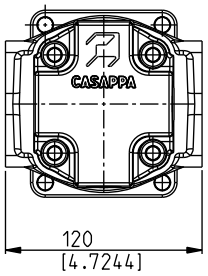
Motor type	A	B	C
	mm (in)	mm (in)	mm (in)
PLM 20•4	86,5 (3.4055)	25,75 (1.0138)	43,25 (1.7028)
PLM 20•6,3	89 (3.5039)	27 (1.0630)	44,5 (1.7520)
PLM 20•7,2	90 (3.5445)	27,5 (1.083)	45 (1.7722)
PLM 20•8	91,5 (3.6024)	28,25 (1.1122)	45,75 (1.8012)
PLM 20•9	92,8 (3.6535)	28,9 (1.1378)	46,4 (1.8268)
PLM 20•10,5	95,5 (3.7598)	30,25 (1.1909)	47,75 (1.8799)
PLM 20•11,2	96 (3.7795)	30,5 (1.2008)	48 (1.8898)
PLM 20•14	101 (3.9764)	33 (1.2992)	50,5 (1.9882)
PLM 20•16	104,5 (4.1142)	34,75 (1.3681)	52,25 (2.0571)
PLM 20•19	107,9 (4.2480)	36,45 (1.4350)	53,9 (2.12)
PLM 20•20	111 (4.3701)	38 (1.4961)	55,5 (2.1850)
PLM 20•24,5	116,6 (4.5905)	40,8 (1.6063)	58,3 (2.2953)
PLM 20•25	119 (4.6850)	42 (1.6535)	59,5 (2.3425)
PLM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	60,85 (2.3957)
PLM 20•31,5	129 (5.0787)	47 (1.8504)	64,5 (2.5394)

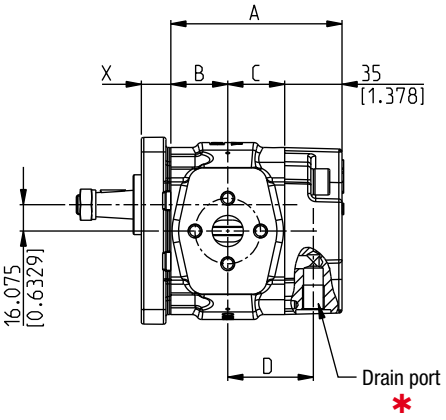
05/02.2018

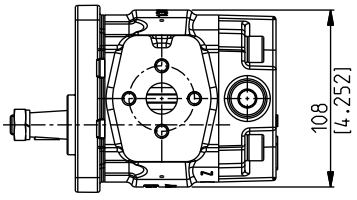
POLARIS PH — GEAR MOTOR DIMENSIONS — V8

Configuration shown:
Clockwise rotation CRD
Anti-cavitation valve

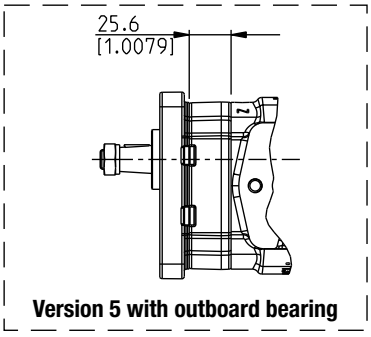








DCAT_043_109



Version 5 with outboard bearing

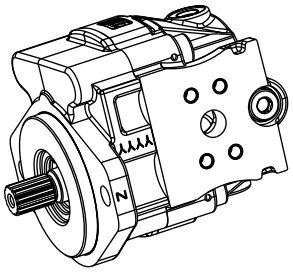
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

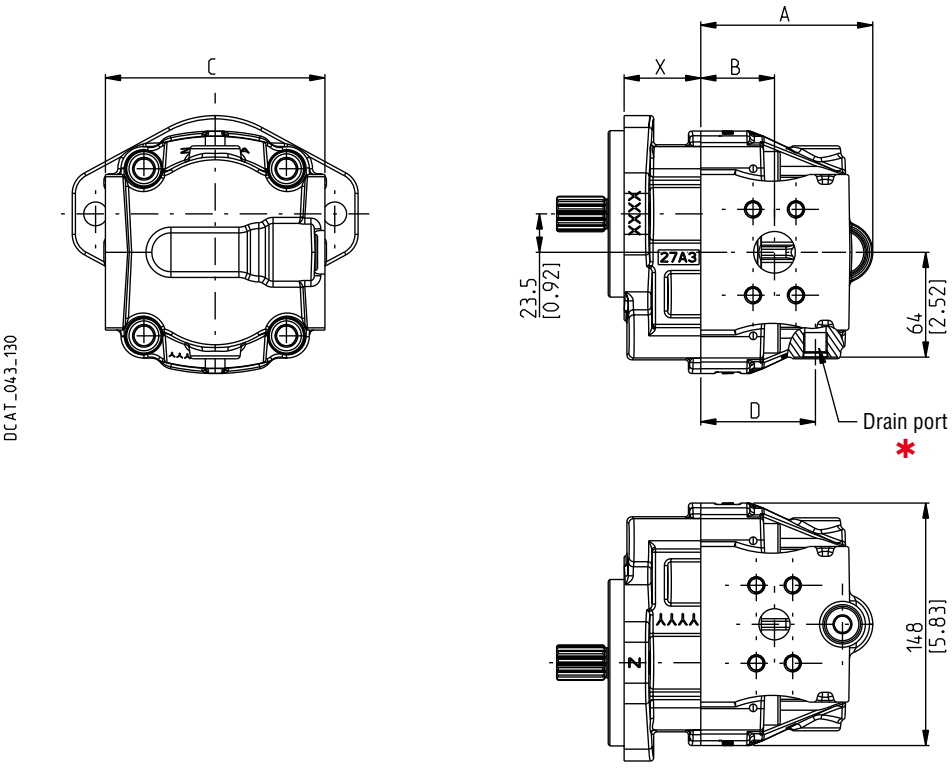
Motor type	A	B	C	D
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PHM 20•8	91,5 (3.6024)	32,5 (1.2795)	24 (0.9449)	41,5 (1.6339)
PHM 20•10,5	95,5 (3.7598)	36,5 (1.4370)	24 (0.9449)	41,5 (1.6339)
PHM 20•11,2	96 (3.7795)	37 (1.4567)	24 (0.9449)	41,5 (1.6339)
PHM 20•14	101 (3.9764)	42 (1.6535)	24 (0.9449)	41,5 (1.6339)
PHM 20•16	104,5 (4.1142)	34,75 (1.3681)	34,75 (1.3681)	52,25 (2.0571)
PHM 20•18	106,7 (4.2008)	35,85 (1.4114)	35,85 (1.4114)	53,35 (2.1004)
PHM 20•19	107,9 (4.2480)	36,45 (1.4350)	36,45 (1.4350)	53,95 (2.1240)
PHM 20•20	111 (4.3701)	38 (1.4961)	38 (1.4961)	55,5 (2.1850)
PHM 20•23	114,3 (4.5000)	39,65 (1.5610)	39,65 (1.5610)	57,15 (2.2500)
PHM 20•24,5	116,6 (4.5905)	40,8 (1.6063)	40,8 (1.6063)	58,3 (2.2953)
PHM 20•25	119 (4.6850)	42 (1.6535)	42 (1.6535)	59,5 (2.3425)
PHM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	43,35 (1.7067)	60,85 (2.3957)
PHM 20•31,5	129 (5.0787)	47 (1.8504)	47 (1.8504)	64,5 (2.5394)

05/02.2018

KAPPA 30 HSY — GEAR MOTOR DIMENSIONS — V8/V11

Configuration shown:
Clockwise rotation CRD
Anti-cavitation valve





V8 anti-cavitation valve available with type 22-27-31-34-38
V11 anti-cavitation valve available with type 41-43-46-51-56

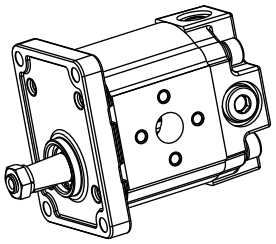
X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

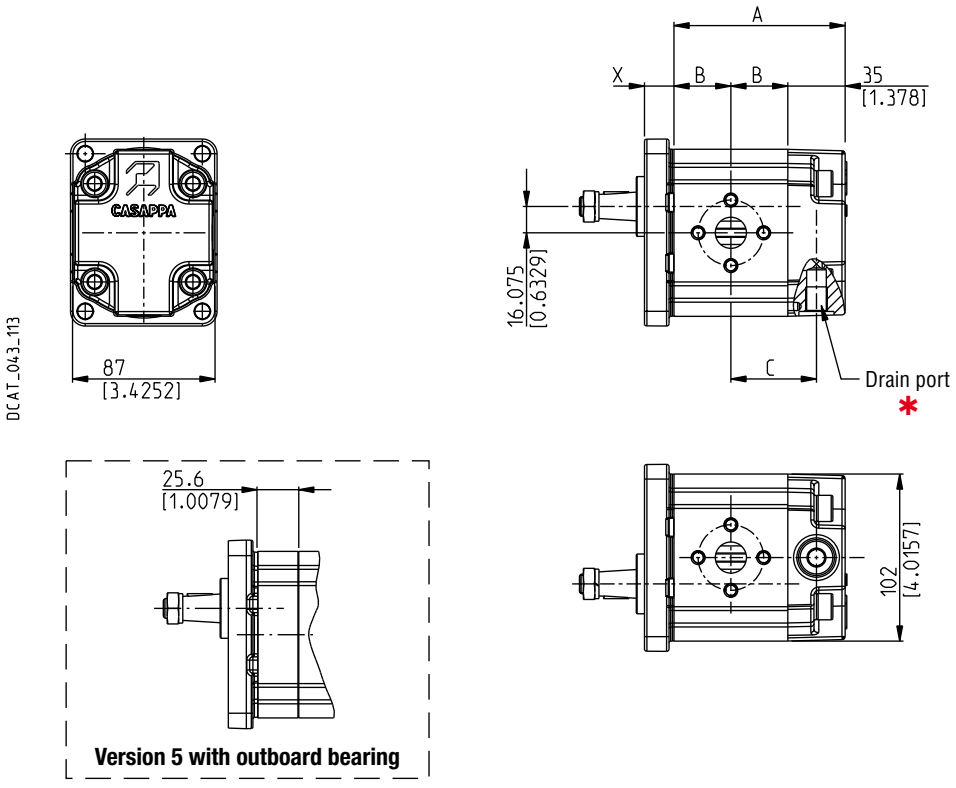
Motor type	A	B	C		D
			European - Split ports	Gas - SAE ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
KM 30•22	97 (3.82)	39 (1.54)	134 (5.28)	142 (5.59)	62 (2.44)
KM 30•27	100 (3.94)	42 (1.65)	134 (5.28)	142 (5.59)	65 (2.56)
KM 30•31	102,5 (4.04)	44,5 (1.75)	134 (5.28)	142 (5.59)	67,5 (2.66)
KM 30•34	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•38	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•41	110 (4.33)	39,5 (1.56)	134 (5.28)	142 (5.59)	76,5 (3.01)
KM 30•43	111,5 (4.39)	41 (1.61)	134 (5.28)	142 (5.59)	78 (3.07)
KM 30•46	113 (4.45)	42,5 (1.67)	134 (5.28)	142 (5.59)	79,5 (3.13)
KM 30•51	116,5 (4.59)	46 (1.81)	134 (5.28)	142 (5.59)	83 (3.27)
KM 30•56	119,5 (4.70)	49 (1.93)	134 (5.28)	142 (5.59)	86 (3.39)

06/12.2022

POLARIS 20 — GEAR MOTOR DIMENSIONS — VPIF

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve fixed setting
and anti-cavitation





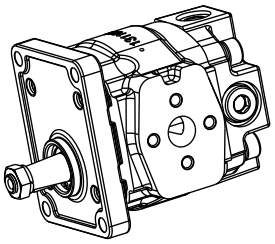
X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

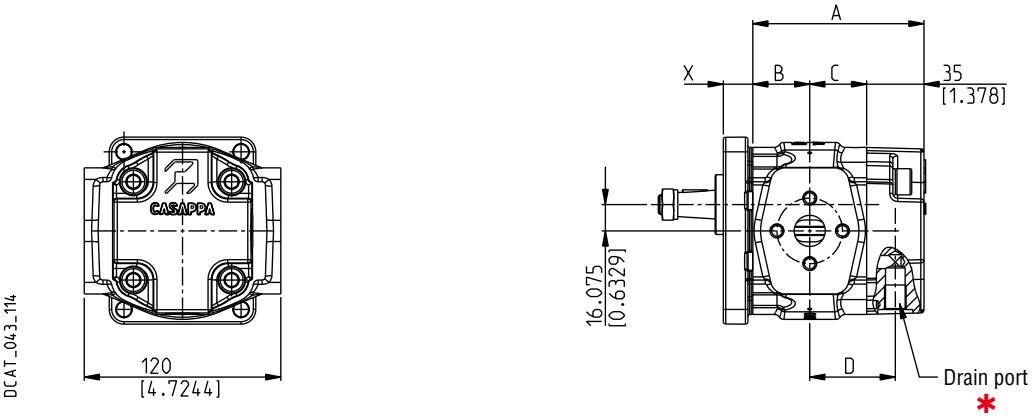
Motor type	A	B	C
	mm (in)	mm (in)	mm (in)
PLM 20•4	86,5 (3.4055)	25,75 (1.0138)	43,25 (1.7028)
PLM 20•6,3	89 (3.5039)	27 (1.0630)	44,5 (1.7520)
PLM 20•7,2	90 (3.5433)	27,5 (1.0827)	45 (1.7717)
PLM 20•8	91,5 (3.6024)	28,25 (1.1122)	45,75 (1.8012)
PLM 20•9	92,8 (3.6535)	28,9 (1.1378)	46,4 (1.8268)
PLM 20•10,5	95,5 (3.7598)	30,25 (1.1909)	47,75 (1.8799)
PLM 20•11,2	96 (3.7795)	30,5 (1.2008)	48 (1.8898)
PLM 20•14	101 (3.9764)	33 (1.2992)	50,5 (1.9882)
PLM 20•16	104,5 (4.1142)	34,75 (1.3681)	52,25 (2.0571)
PLM 20•19	107,9 (4.2480)	36,45 (1.4350)	53,95 (2.1240)
PLM 20•20	111 (4.3701)	38 (1.4961)	55,5 (2.1850)
PLM 20•24,5	116,6 (4.5906)	40,8 (1.6063)	58,3 (2.2953)
PLM 20•25	119 (4.6850)	42 (1.6535)	59,5 (2.3425)
PLM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	60,85 (2.3957)
PLM 20•31,5	129 (5.0787)	47 (1.8504)	64,5 (2.5394)

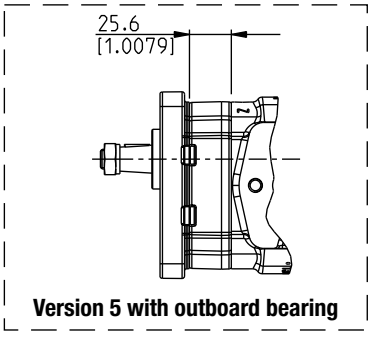
05/02.2018

POLARIS PH — GEAR MOTOR DIMENSIONS — VPIF

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve fixed setting
and anti-cavitation







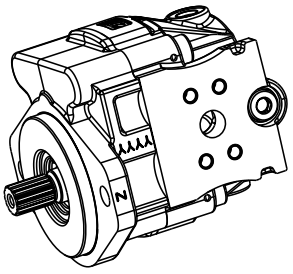
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

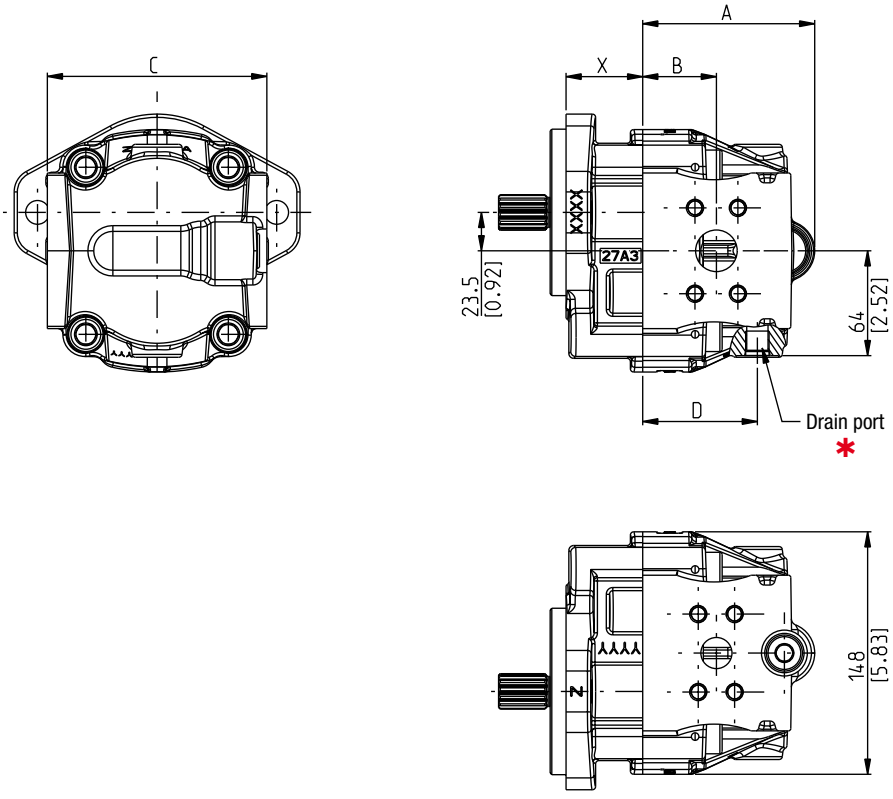
Motor type	A	B	C	D
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PHM 20•8	91,5 (3.6024)	32,5 (1.2795)	24 (0.9449)	41,5 (1.6339)
PHM 20•10,5	95,5 (3.7598)	36,5 (1.4370)	24 (0.9449)	41,5 (1.6339)
PHM 20•11,2	96 (3.7795)	37 (1.4567)	24 (0.9449)	41,5 (1.6339)
PHM 20•14	101 (3.9764)	42 (1.6535)	24 (0.9449)	41,5 (1.6339)
PHM 20•16	104,5 (4.1142)	34,75 (1.3681)	34,75 (1.3681)	52,25 (2.0571)
PHM 20•18	106,7 (4.2008)	35,85 (1.4114)	35,85 (1.4114)	53,35 (2.1004)
PHM 20•19	107,9 (4.2480)	36,45 (1.4350)	36,45 (1.4350)	53,95 (2.1240)
PHM 20•20	111 (4.3701)	38 (1.4961)	38 (1.4961)	55,5 (2.1850)
PHM 20•23	114,3 (4.5000)	39,65 (1.5610)	39,65 (1.5610)	57,15 (2.2500)
PHM 20•24,5	116,6 (4.5905)	40,8 (1.6063)	40,8 (1.6063)	58,3 (2.2953)
PHM 20•25	119 (4.6850)	42 (1.6535)	42 (1.6535)	59,5 (2.3425)
PHM 20•27,8	121,7 (4.7913)	43,35 (1.7067)	43,35 (1.7067)	60,85 (2.3957)
PHM 20•31,5	129 (5.0787)	47 (1.8504)	47 (1.8504)	64,5 (2.5394)

05/02.2018

KAPPA 30 HSY — GEAR MOTOR DIMENSIONS — VPIF

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve fixed setting
and anti-cavitation





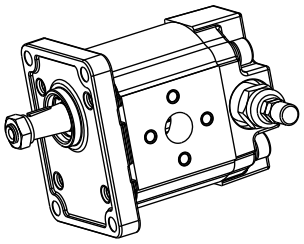
X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

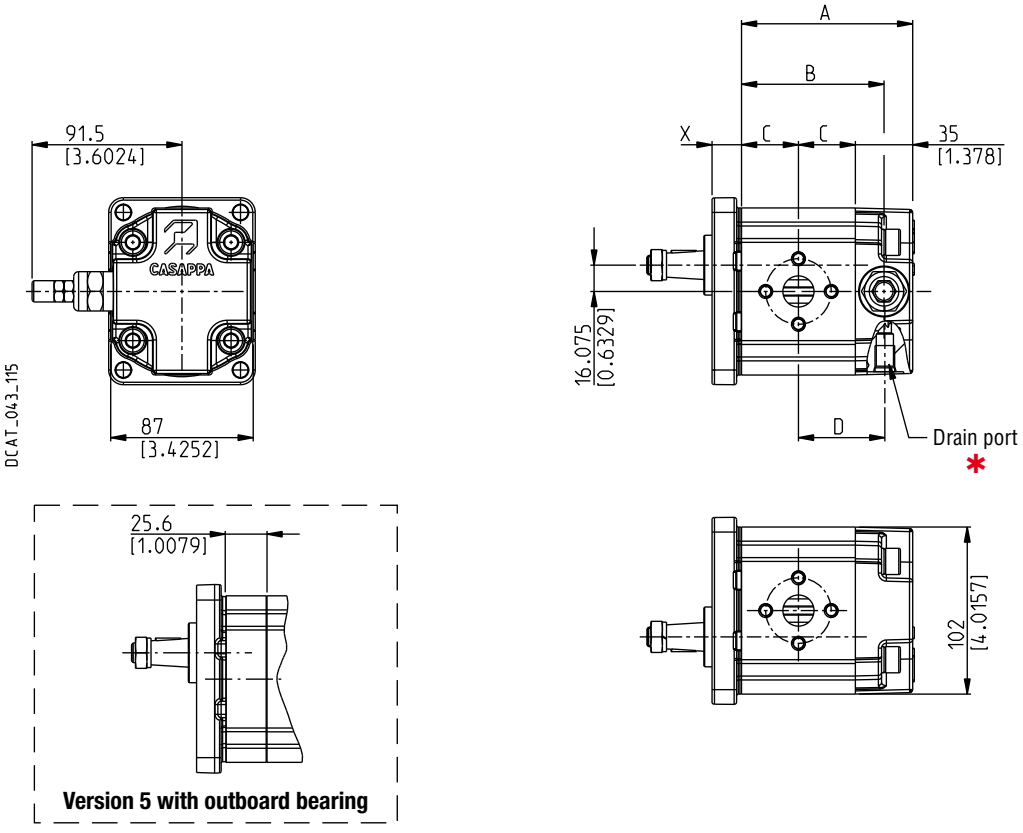
Motor type	A	B	C		D
			European - Split ports	Gas - SAE ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
KM 30•22	97 (3.82)	39 (1.54)	134 (5.28)	142 (5.59)	62 (2.44)
KM 30•27	100 (3.94)	42 (1.65)	134 (5.28)	142 (5.59)	65 (2.56)
KM 30•31	102,5 (4.04)	44,5 (1.75)	134 (5.28)	142 (5.59)	67,5 (2.66)
KM 30•34	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•38	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•41	110 (4.33)	39,5 (1.56)	134 (5.28)	142 (5.59)	76,5 (3.01)
KM 30•43	111,5 (4.39)	41 (1.61)	134 (5.28)	142 (5.59)	78 (3.07)
KM 30•46	113 (4.45)	42,5 (1.67)	134 (5.28)	142 (5.59)	79,5 (3.13)
KM 30•51	116,5 (4.59)	46 (1.81)	134 (5.28)	142 (5.59)	83 (3.27)
KM 30•56	119,5 (4.70)	49 (1.93)	134 (5.28)	142 (5.59)	86 (3.39)

06/12.2022

POLARIS 20 — GEAR MOTOR DIMENSIONS — VMP5/TS/V9

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve adjustable setting and anti-cavitation





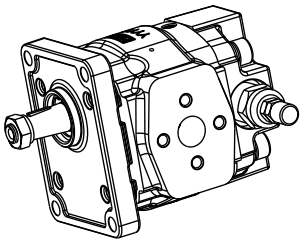
X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

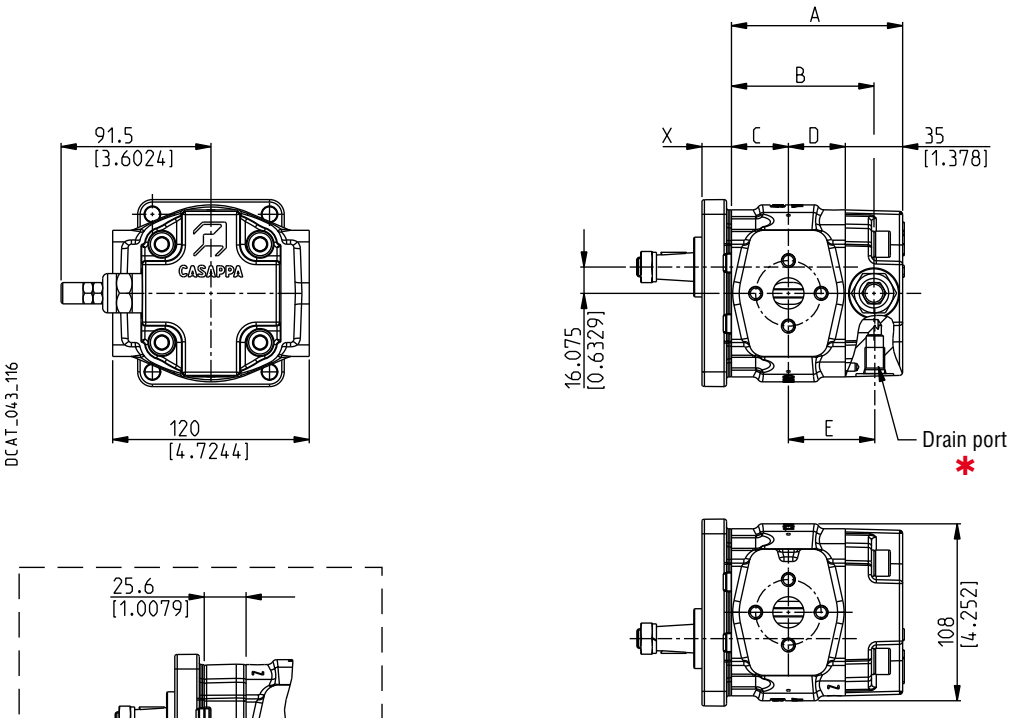
Motor type	A	B	C	D
	mm (in)	mm (in)	mm (in)	mm (in)
PLM 20•4	86,5 (3.4055)	69 (2.7165)	25,75 (1.0138)	43,25 (1.7028)
PLM 20•6,3	89 (3.5039)	71,5 (2.8150)	27 (1.0630)	44,5 (1.7520)
PLM 20•7,2	90 (3.5433)	72,5 (2.8543)	27,5 (1.0827)	45 (1.7717)
PLM 20•8	91,5 (3.6024)	74 (2.9134)	28,25 (1.1122)	45,75 (1.8012)
PLM 20•9	92,8 (3.6535)	75,3 (2.9646)	28,9 (1.1378)	46,4 (1.8268)
PLM 20•10,5	95,5 (3.7598)	78 (3.0709)	30,25 (1.1909)	47,75 (1.8799)
PLM 20•11,2	96 (3.7795)	78,5 (3.0906)	30,5 (1.2008)	48 (1.8898)
PLM 20•14	101 (3.9764)	83,5 (3.2874)	33 (1.2992)	50,5 (1.9882)
PLM 20•16	104,5 (4.1142)	87 (3.4252)	34,75 (1.3681)	52,25 (2.0571)
PLM 20•19	107,9 (4.2480)	90,4 (3.5591)	36,45 (1.4350)	53,95 (2.1240)
PLM 20•20	111 (4.3701)	93,5 (3.6811)	38 (1.4961)	55,5 (2.1850)
PLM 20•24,5	116,6 (4.5906)	99,1 (3.9016)	40,8 (1.6063)	58,3 (2.2953)
PLM 20•25	119 (4.6850)	101,5 (3.9961)	42 (1.6535)	59,5 (2.3425)
PLM 20•27,8	121,7 (4.7913)	104,2 (4.1024)	43,35 (1.7067)	60,85 (2.3957)
PLM 20•31,5	129 (5.0787)	111,5 (4.3898)	47 (1.8504)	64,5 (2.5394)

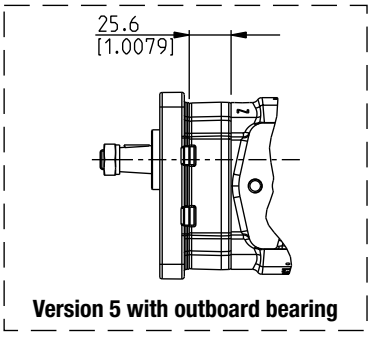
05/02.2018

POLARIS PH — GEAR MOTOR DIMENSIONS — VMP5/TS/V9

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve adjustable setting and anti-cavitation







Version 5 with outboard bearing

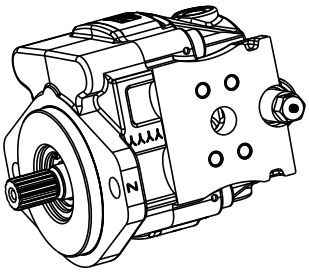
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

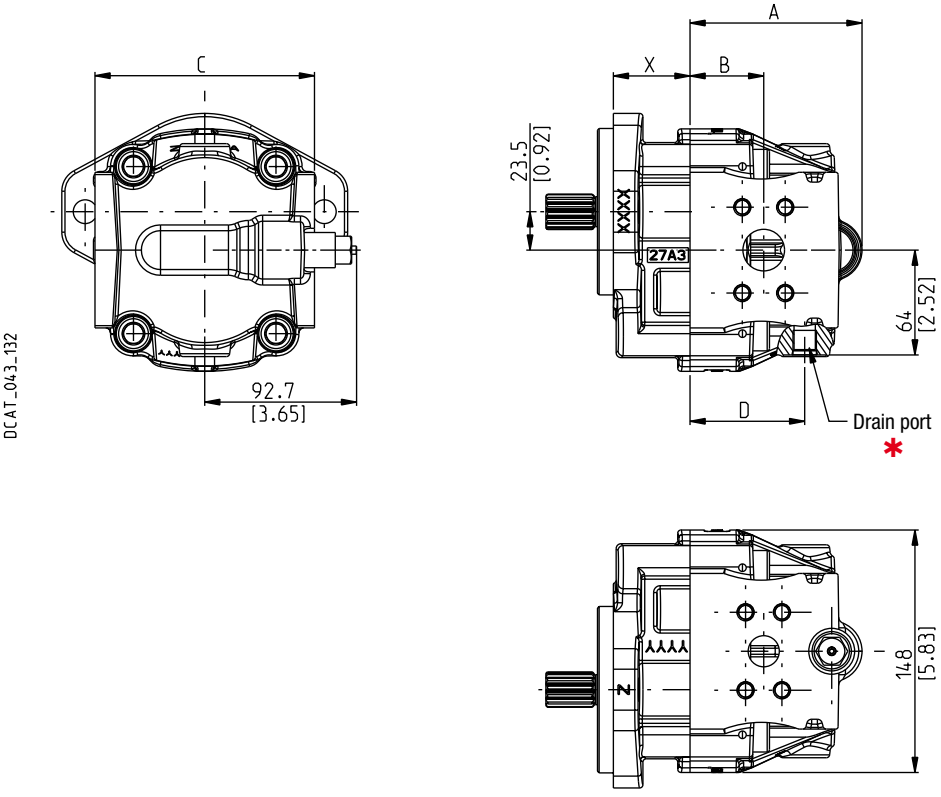
Motor type	A	B	C	D	E
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PHM 20•8	91,5 (3.6024)	74 (2.9134)	32,5 (1.2795)	24 (0.9449)	41,5 (1.6339)
PHM 20•10,5	95,5 (3.7598)	78 (3.0709)	36,5 (1.4370)	24 (0.9449)	41,5 (1.6339)
PHM 20•11,2	96 (3.7795)	78,5 (3.0906)	37 (1.4567)	24 (0.9449)	41,5 (1.6339)
PHM 20•14	101 (3.9764)	83,5 (3.2874)	42 (1.6535)	24 (0.9449)	41,5 (1.6339)
PHM 20•16	104,5 (4.1142)	87 (3.4252)	34,75 (1.3681)	34,75 (1.3681)	52,25 (2.0571)
PHM 20•18	106,7 (4.2008)	89,2 (3.5118)	35,85 (1.4114)	35,85 (1.4114)	53,35 (2.1004)
PHM 20•19	107,9 (4.2480)	90,4 (3.5591)	36,45 (1.4350)	36,45 (1.4350)	53,95 (2.1240)
PHM 20•20	111 (4.3701)	93,5 (3.6811)	38 (1.4961)	38 (1.4961)	55,5 (2.1850)
PHM 20•23	114,3 (4.5000)	96,8 (3.38110)	39,65 (1.5610)	39,65 (1.5610)	57,15 (2.2500)
PHM 20•24,5	116,6 (4.5905)	99,1 (3.9016)	40,8 (1.6063)	40,8 (1.6063)	58,3 (2.2953)
PHM 20•25	119 (4.6850)	101,5 (3.9961)	42 (1.6535)	42 (1.6535)	59,5 (2.3425)
PHM 20•27,8	121,7 (4.7913)	104,2 (4.1024)	43,35 (1.7067)	43,35 (1.7067)	60,85 (2.3957)
PHM 20•31,5	129 (5.0787)	111,5 (4.3898)	47 (1.8504)	47 (1.8504)	64,5 (2.5394)

05/02.2018

KAPPA 30 HSY — GEAR MOTOR DIMENSIONS — VPIR

Configuration shown:
Clockwise rotation CRD
Max. pressure relief valve adjustable setting and anti-cavitation





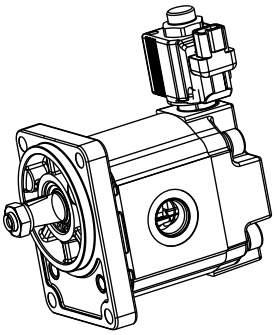
X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

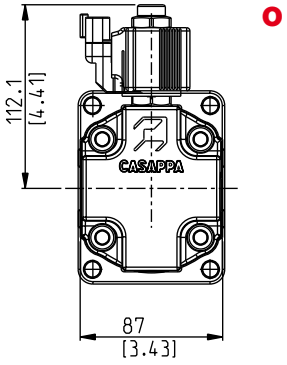
Motor type	A	B	C		D
			European - Split ports	Gas - SAE ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
KM 30•22	97 (3.82)	39 (1.54)	134 (5.28)	142 (5.59)	62 (2.44)
KM 30•27	100 (3.94)	42 (1.65)	134 (5.28)	142 (5.59)	65 (2.56)
KM 30•31	102,5 (4.04)	44,5 (1.75)	134 (5.28)	142 (5.59)	67,5 (2.66)
KM 30•34	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•38	105 (4.13)	47 (1.85)	134 (5.28)	142 (5.59)	70 (2.76)
KM 30•41	110 (4.33)	39,5 (1.56)	134 (5.28)	142 (5.59)	76,5 (3.01)
KM 30•43	111,5 (4.39)	41 (1.61)	134 (5.28)	142 (5.59)	78 (3.07)
KM 30•46	113 (4.45)	42,5 (1.67)	134 (5.28)	142 (5.59)	79,5 (3.13)
KM 30•51	116,5 (4.59)	46 (1.81)	134 (5.28)	142 (5.59)	83 (3.27)
KM 30•56	119,5 (4.70)	49 (1.93)	134 (5.28)	142 (5.59)	86 (3.39)

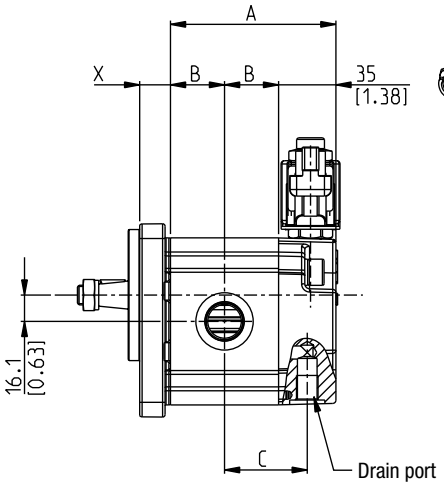
06/12.2022

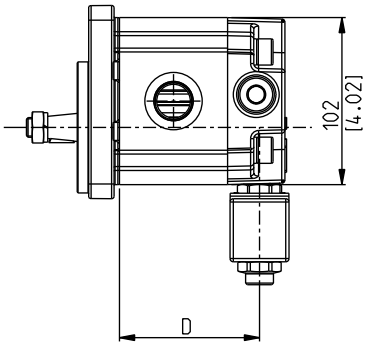
POLARIS 20 GEAR MOTOR DIMENSIONS UNL/VPIF

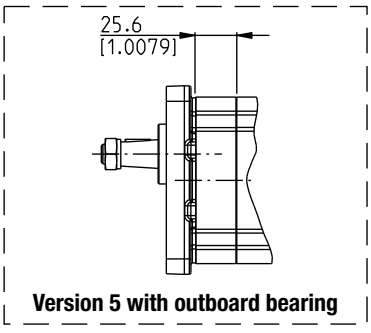
Configuration shown:
Clockwise rotation CRD
ON/OFF two speed valve
Max. pressure relief valve fixed setting
and anti-cavitation











X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

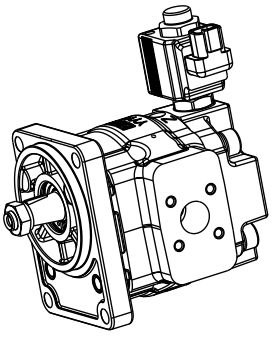
Motor type	A	B	C	D
	mm (in)	mm (in)	mm (in)	mm (in)
PLM 20•4	89 (3.50)	25,75 (1.0138)	43,25 (1.7028)	71 (2.7953)
PLM 20•6,3	91,5 (3.60)	27 (1.0630)	44,5 (1.7520)	73,5 (2.8937)
PLM 20•7,2	92,5 (3.64)	27,5 (1.0827)	45 (1.7717)	74,5 (2.9331)
PLM 20•8	94 (3.70)	28,25 (1.1122)	45,75 (1.8012)	76 (2.9921)
PLM 20•9	95,3 (3.75)	28,9 (1.1378)	46,4 (1.8268)	77,3 (3.0433)
PLM 20•10,5	98 (3.86)	30,25 (1.1909)	47,75 (1.8799)	80 (3.1496)
PLM 20•11,2	98,5 (3.88)	30,5 (1.2008)	48 (1.8898)	80,5 (3.1693)
PLM 20•14	103,5 (4.07)	33 (1.2992)	50,5 (1.9882)	85,5 (3.3661)
PLM 20•16	107 (4.21)	34,75 (1.3681)	52,25 (2.0571)	89 (3.5039)
PLM 20•19	110,4 (4.35)	36,45 (1.4350)	53,95 (2.1240)	92,4 (3.6378)
PLM 20•20	113,5 (4.47)	38 (1.4961)	55,5 (2.1850)	95,5 (3.7598)
PLM 20•24,5	119,1 (4.69)	40,8 (1.6063)	58,3 (2.2953)	101,1 (3.9803)
PLM 20•25	121,5 (4.78)	42 (1.6535)	59,5 (2.3425)	103,5 (4.0748)
PLM 20•27,8	124,2 (4.89)	43,35 (1.7067)	60,85 (2.3957)	106,2 (4.1811)
PLM 20•31,5	131,5 (5.18)	47 (1.8504)	64,5 (2.5394)	113,5 (4.4685)

Replaces: 05/02.2018

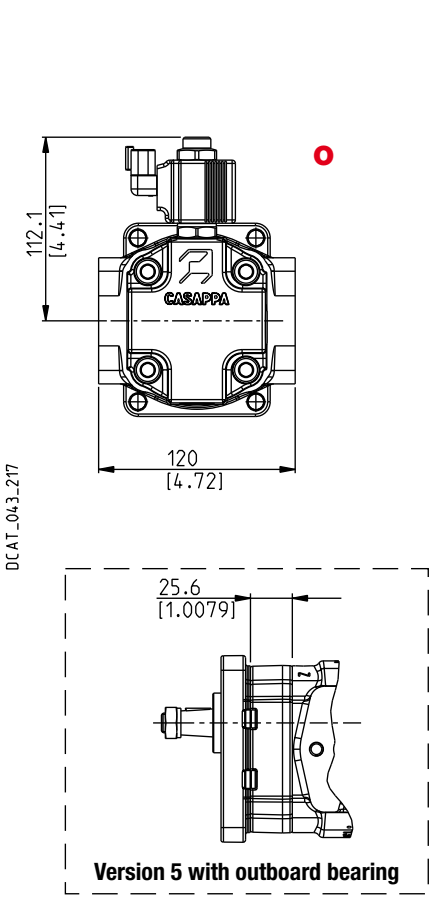
O 06/12.2022

POLARIS PH — GEAR MOTOR DIMENSIONS — UNL/VPIF

Configuration shown:
Clockwise rotation CRD
ON/OFF two speed valve
Max. pressure relief valve fixed setting
and anti-cavitation



Replaces: 05/02.2018



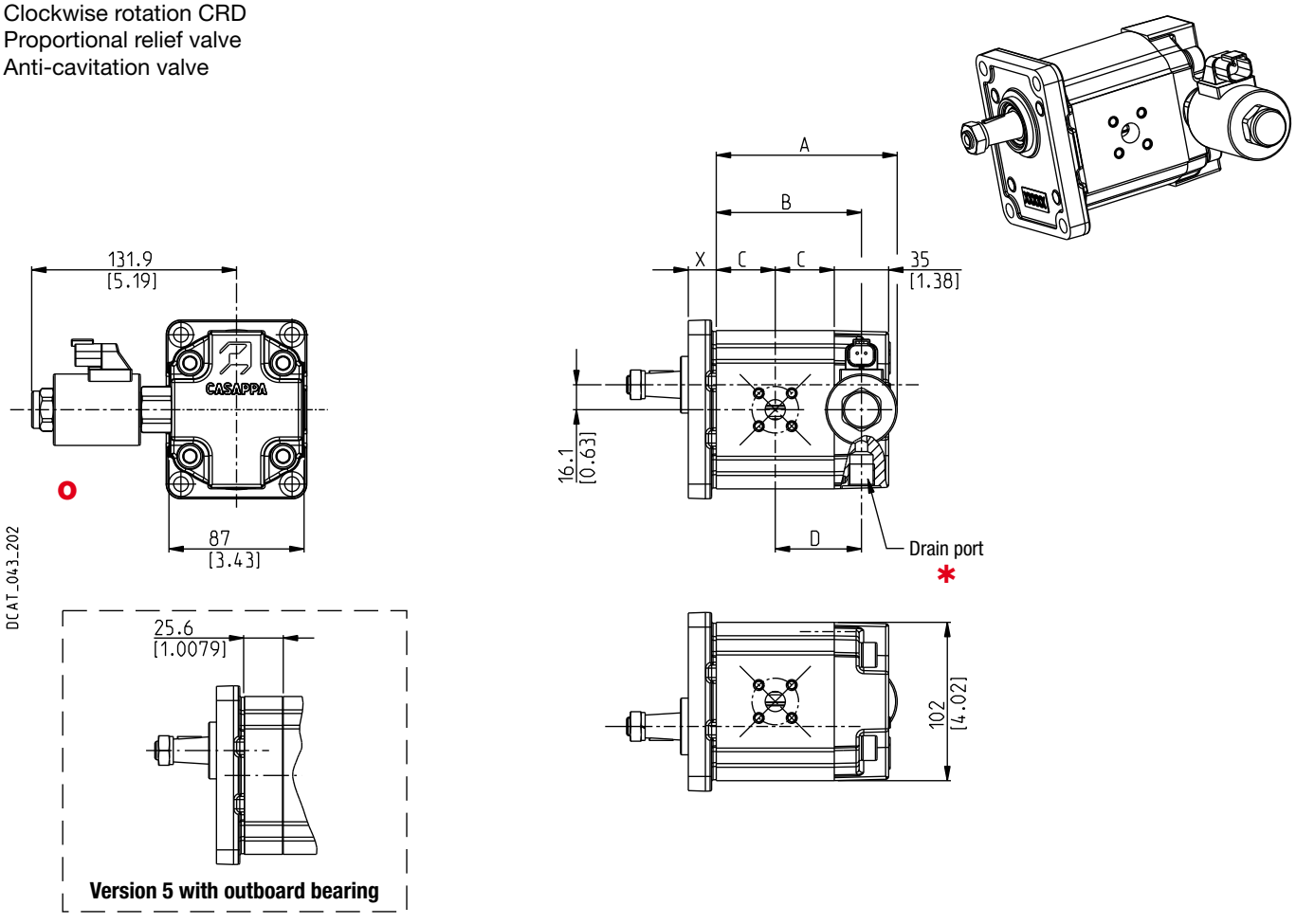
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

Motor type	A	B	C	D	E
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch
PHM 20•8	94 (3.70)	32,5 (1.28)	24 (0.94)	41,5 (1.63)	76 (2.99)
PHM 20•10,5	98 (3.86)	36,5 (1.41)	24 (0.94)	41,5 (1.63)	80 (3.15)
PHM 20•11,2	98,5 (3.88)	37 (1.46)	24 (0.94)	41,5 (1.63)	80,5 (3.17)
PHM 20•14	103,5 (4.07)	42 (1.65)	24 (0.94)	41,5 (1.63)	85,5 (3.37)
PHM 20•16	107 (4.21)	34,75 (1.37)	34,75 (1.37)	52,25 (2.06)	89 (3.50)
PHM 20•18	109,2 (4.30)	35,85 (1.41)	35,85 (1.41)	53,35 (2.10)	91,2 (3.59)
PHM 20•19	110,4 (4.35)	36,45 (1.44)	36,45 (1.44)	53,95 (2.12)	92,4 (3.64)
PHM 20•20	113,5 (4.47)	38 (1.50)	38 (1.50)	55,5 (2.19)	95,5 (3.76)
PHM 20•23	116,8 (4.60)	39,65 (1.56)	39,65 (1.56)	57,15 (2.25)	98,8 (3.89)
PHM 20•24,5	119,1 (4.69)	40,8 (1.61)	40,8 (1.61)	58,3 (2.30)	101,1 (3.98)
PHM 20•25	121,5 (4.78)	42 (1.65)	42 (1.65)	59,5 (2.34)	103,5 (4.07)
PHM 20•27,8	124,2 (4.89)	43,35 (1.71)	43,35 (1.71)	60,85 (2.40)	106,2 (4.18)
PHM 20•31,5	131,5 (5.18)	47 (1.85)	47 (1.85)	64,5 (2.54)	113,5 (4.47)

o 06/12.2022

POLARIS 20 GEAR MOTOR DIMENSIONS PRV/V9

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Anti-cavitation valve



X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

Motor type	A	B	C	D
	mm (in)	mm (in)	mm (in)	mm (in)
PLM 20•4	92 (3.62)	69 (2.7165)	25,75 (1.0138)	43,25 (1.7028)
PLM 20•6,3	94,5 (3.72)	71,5 (2.8150)	27 (1.0630)	44,5 (1.7520)
PLM 20•7,2	95,5 (3.76)	72,5 (2.8543)	27,5 (1.0827)	45 (1.7716)
PLM 20•8	97 (3.82)	74 (2.9134)	28,25 (1.1122)	45,75 (1.8012)
PLM 20•9	98,3 (3.87)	75,3 (2.9646)	28,9 (1.1378)	46,4 (1.8268)
PLM 20•10,5	101 (3.998)	78 (3.0709)	30,25 (1.1909)	47,75 (1.8799)
PLM 20•11,2	101,5 (4.00)	78,5 (3.0906)	30,5 (1.2008)	48 (1.8898)
PLM 20•14	106,5 (4.19)	83,5 (3.2874)	33 (1.2992)	50,5 (1.9882)
PLM 20•16	110 (4.33)	87 (3.4252)	34,75 (1.3681)	52,25 (2.0571)
PLM 20•19	113,4 (4.46)	90,4 (3.5591)	36,45 (1.4350)	53,95 (2.1240)
PLM 20•20	116,5 (4.59)	93,5 (3.6811)	38 (1.4961)	55,5 (2.1850)
PLM 20•24,5	122,1 (4.81)	99,1 (3.9016)	40,8 (1.6063)	58,3 (2.2953)
PLM 20•25	124,5 (4.90)	101,5 (3.9961)	42 (1.6535)	59,5 (2.3425)
PLM 20•27,8	127,2 (5.01)	104,2 (4.1024)	43,35 (1.7067)	60,85 (2.3957)
PLM 20•31,5	134,5 (5.30)	111,5 (4.3398)	47 (1.8504)	64,5 (2.5394)

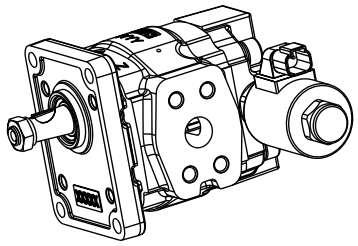
Replaces: 05/02.2018

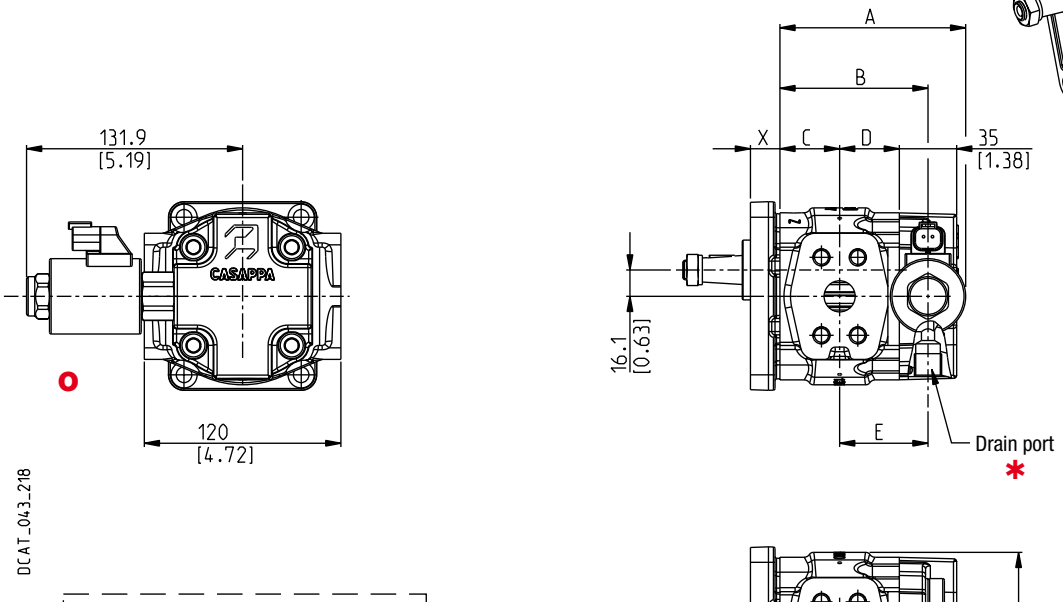
○ 06/12.2022

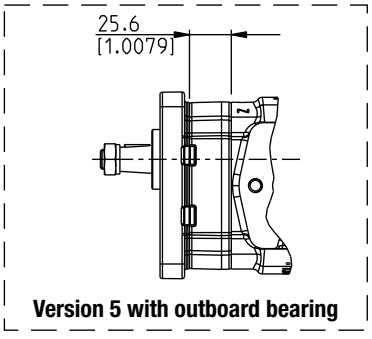
POLARIS PH — GEAR MOTOR DIMENSIONS — PRV/V9

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Anti-cavitation valve

Replaces: 05/02.2018







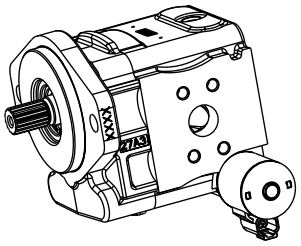
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

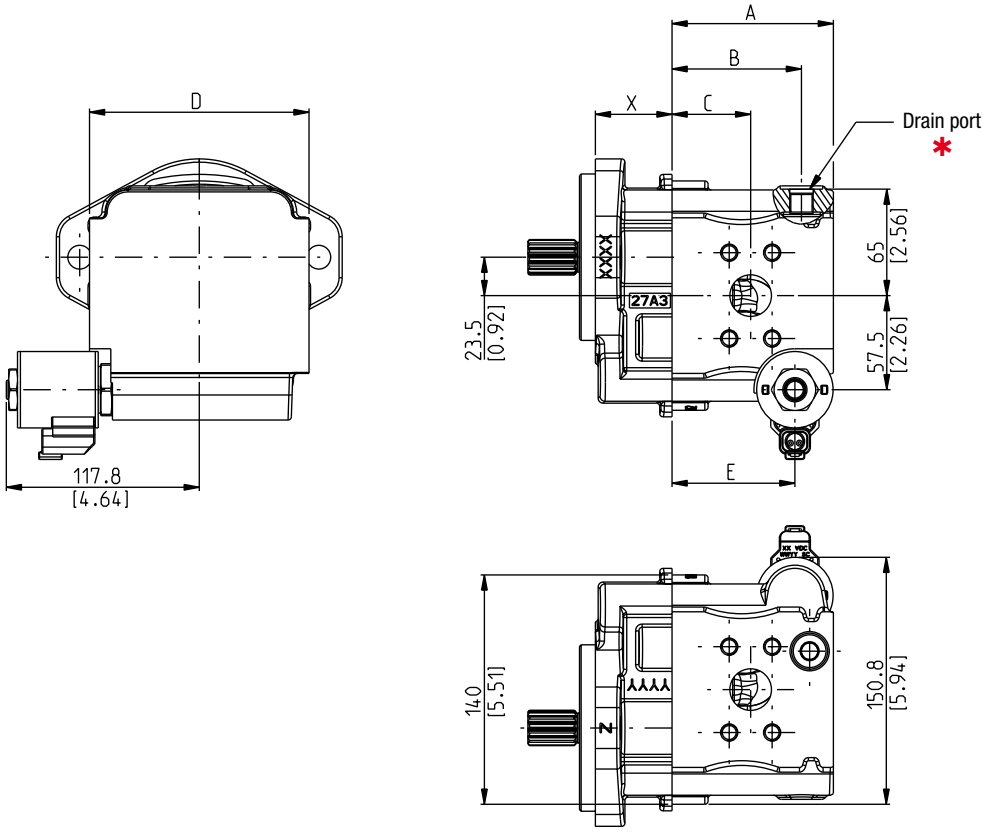
Motor type	A	B	C	D	E
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PHM 20•8	97 (3.82)	74 (2.9134)	32,5 (1.2795)	24 (0.9449)	41,5 (1.6339)
PHM 20•10,5	101 (3.98)	78 (3.0709)	36,5 (1.4370)	24 (0.9449)	41,5 (1.6339)
PHM 20•11,2	101,5 (4.00)	78,5 (3.0906)	37 (1.4567)	24 (0.9449)	41,5 (1.6339)
PHM 20•14	106,5 (4.19)	83,5 (3.2874)	42 (1.6535)	24 (0.9449)	41,5 (1.6339)
PHM 20•16	110 (4.33)	87 (3.4252)	34,75 (1.3681)	34,75 (1.3681)	52,25 (2.0571)
PHM 20•18	112,2 (4.42)	89,2 (3.5118)	35,85 (1.4114)	35,85 (1.4114)	53,35 (2.1004)
PHM 20•19	113,4 (4.46)	90,4 (3.5591)	36,45 (1.4350)	36,45 (1.4350)	53,95 (2.1240)
PHM 20•20	116,5 (4.59)	93,5 (3.6811)	38 (1.4961)	38 (1.4961)	55,5 (2.1850)
PHM 20•23	119,8 (4.72)	96,8 (3.38110)	39,65 (1.5610)	39,65 (1.5610)	57,15 (2.2500)
PHM 20•24,5	122,1 (4.81)	99,1 (3.9016)	40,8 (1.6063)	40,8 (1.6063)	58,3 (2.2953)
PHM 20•25	124,5 (4.90)	101,5 (3.9961)	42 (1.6535)	42 (1.6535)	59,5 (2.3425)
PHM 20•27,8	127,2 (5.01)	104,2 (4.1024)	43,35 (1.7067)	43,35 (1.7067)	60,85 (2.3957)
PHM 20•31,5	134,5 (5.30)	111,5 (4.3898)	47 (1.8504)	47 (1.8504)	64,5 (2.5394)

o 06/12.2022

KAPPA 30 - CSZ — GEAR MOTOR DIMENSIONS — PRV/V8/V11

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Anti-cavitation valve





V8 anti-cavitation valve available with type 22-27-31-34-38
V11 anti-cavitation valve available with type 41-43-46-51-56

X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

Motor type	A	B	C	D		E
				European - Split ports	Gas - SAE ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
KM 30•22	87,5 (3.44)	68 (2.68)	37 (1.46)	134 (5.28)	142 (5.59)	64 (2.52)
KM 30•27	90,5 (3.56)	71 (2.80)	40 (1.57)	134 (5.28)	142 (5.59)	67 (2.64)
KM 30•31	93 (3.66)	73,5 (2.89)	42,5 (1.67)	134 (5.28)	142 (5.59)	69,5 (2.74)
KM 30•34	95,5 (3.76)	76 (2.99)	45 (1.77)	134 (5.28)	142 (5.59)	72 (2.83)
KM 30•38	98,5 (3.88)	79 (3.11)	48 (1.89)	134 (5.28)	142 (5.59)	75 (2.95)
KM 30•41	100 (3.94)	80,5 (3.17)	49,5 (1.95)	134 (5.28)	142 (5.59)	76,5 (3.01)
KM 30•43	101,5 (4.00)	82 (3.23)	51 (2.01)	134 (5.28)	142 (5.59)	78 (3.07)
KM 30•46	103 (4.06)	83,5 (3.29)	52,5 (2.07)	134 (5.28)	142 (5.59)	79,5 (3.13)
KM 30•51	106,5 (4.19)	87 (3.43)	56 (2.20)	134 (5.28)	142 (5.59)	83 (3.27)
KM 30•56	109,5 (4.31)	90 (3.54)	59 (2.32)	134 (5.28)	142 (5.59)	86 (3.39)

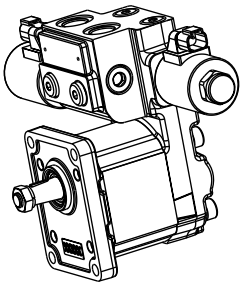
06/12/2022

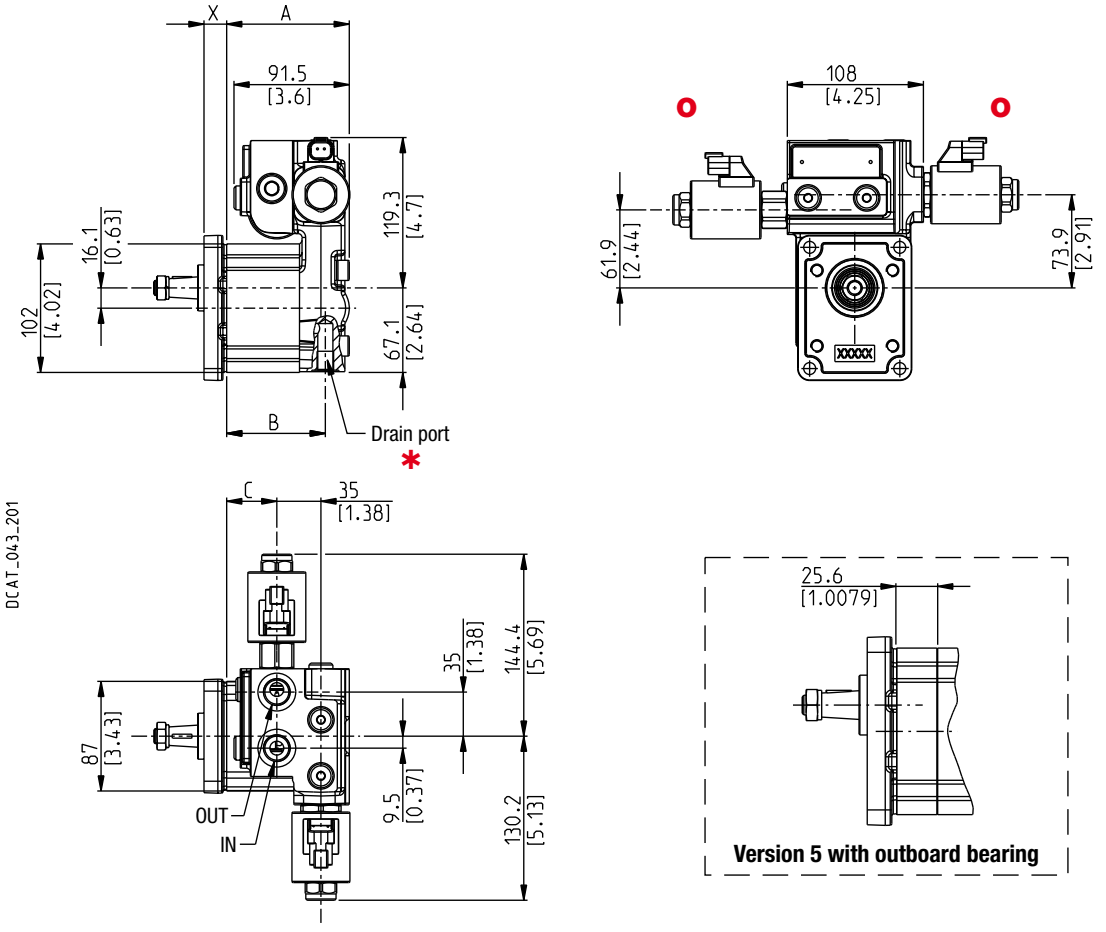
POLARIS 20 — GEAR MOTOR DIMENSIONS — PRV/REV/V8-SK

Replaces: 05/02.2018

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Reverse valve
Anti-cavitation valve

Drain port: ✱ driven shaft position





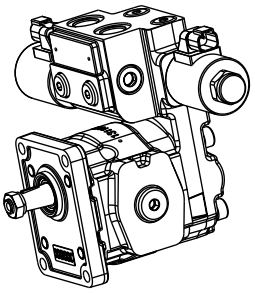
X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

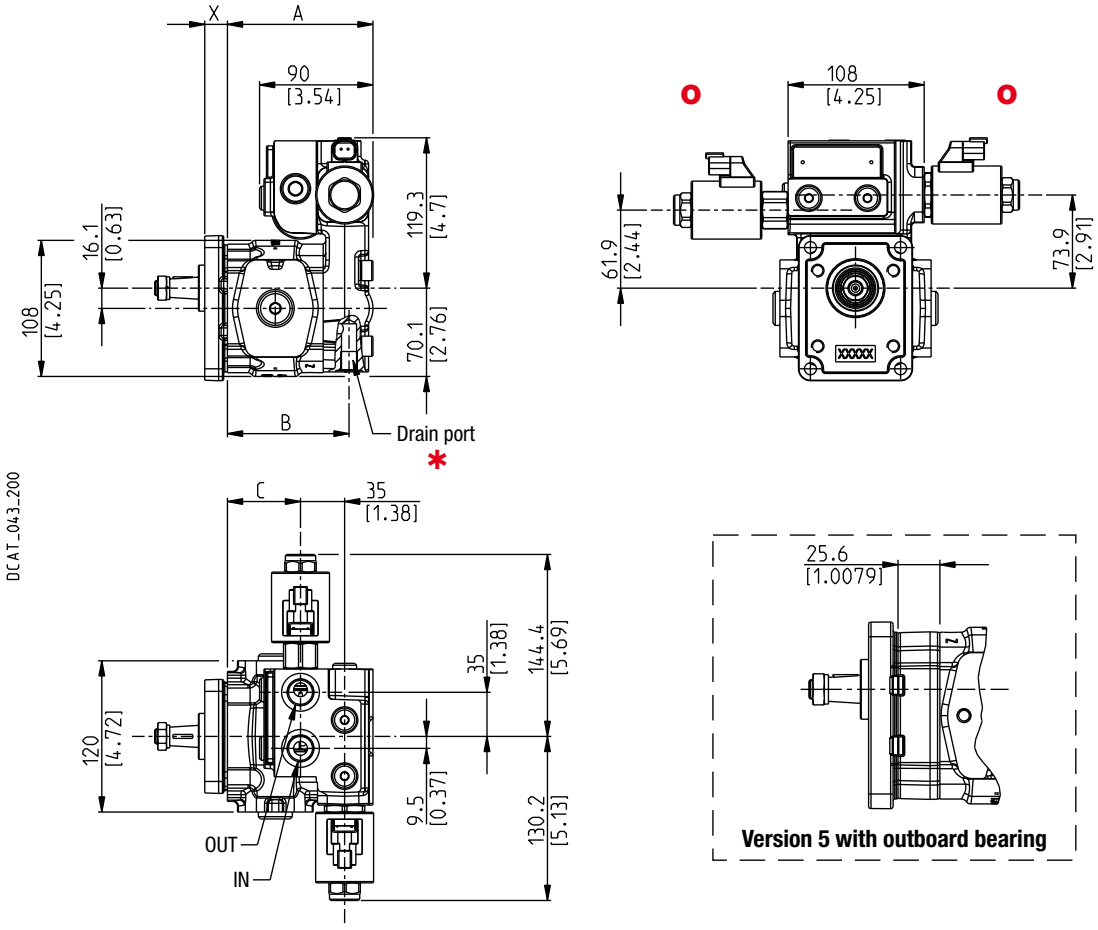
Motor type	A	B	C	IN/OUT Ports	
	mm (in)	mm (in)	mm (in)	Gas BSPP	SAE ODT
PLM 20•4	91 (3.58)	72 (2.83)	33,5 (1.32)		
PLM 20•6,3	93,5 (3.68)	74,5 (2.93)	36 (1.42)		
PLM 20•7,2	94,5 (3.72)	75,5 (2.97)	37 (1.46)		
PLM 20•8	96 (3.78)	77 (3.03)	38,5 (1.52)		
PLM 20•9	97,3 (3.83)	78,3 (3.08)	39,8 (1.57)		
PLM 20•10,5	100 (3.94)	81 (3.19)	42,5 (1.67)		
PLM 20•11,2	100,5 (3.96)	81,5 (3.21)	43 (1.69)		OB/OB
O PLM 20•14	105,5 (4.15)	86,5 (3.41)	48 (1.89)	GD/GD	
PLM 20•16	109 (4.29)	90 (3.54)	51,5 (2.03)		OC/OC
PLM 20•19	112,4 (4.43)	93,4 (3.68)	54,9 (2.16)		
PLM 20•20	115,5 (4.55)	96,5 (3.80)	58 (2.28)		
PLM 20•24,5	121,1 (4.77)	102,1 (4.02)	63,6 (2.50)		
PLM 20•25	123,5 (4.86)	104,5 (4.11)	66 (2.60)		
PLM 20•27,8	126,2 (4.99)	107,2 (4.22)	68,7 (2.70)		
PLM 20•31,5	133,5 (5.26)	114,5 (4.51)	76 (2.99)		

O 06/12.2022

POLARIS PH — GEAR MOTOR DIMENSIONS — PRV/REV/V8-SK

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Reverse valve
Anti-cavitation valve





X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

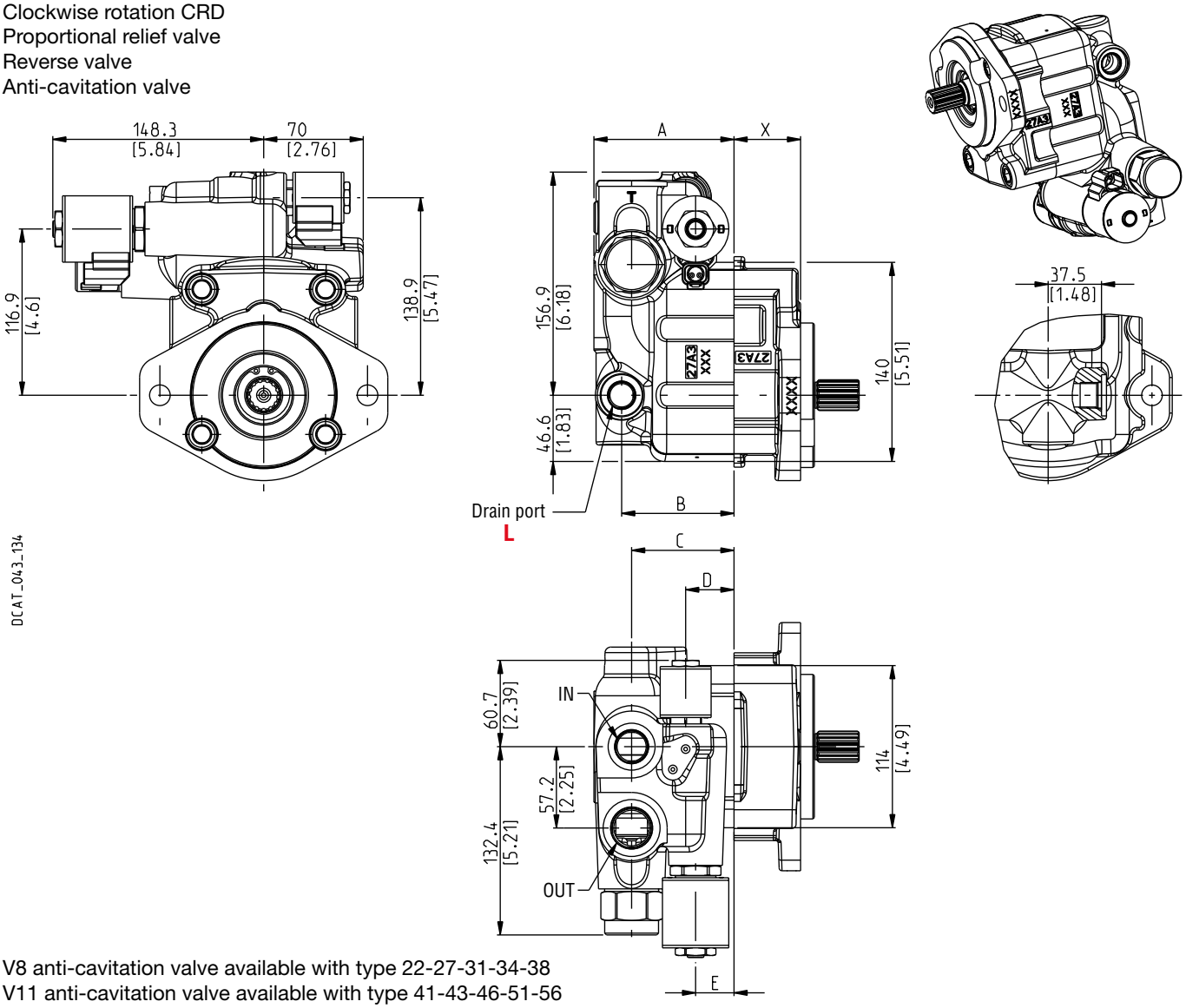
Motor type	A	B	C	IN/OUT Ports	
	mm (inch)	mm (inch)	mm (inch)	Gas BSPP	SAE ODT
PHM 20•8	96 (3.78)	77 (3.03)	38,5 (1.52)	GD/GD	OB/OB OC/OC
PHM 20•10,5	100 (3.94)	81 (3.19)	42,5 (1.67)		
PHM 20•11,2	100,5 (3.96)	81,5 (3.21)	43 (1.69)		
PHM 20•14	105,5 (4.15)	86,5 (3.41)	48 (1.89)		
PHM 20•16	109 (4.29)	90 (3.54)	51,5 (2.03)		
PHM 20•18	111,2 (4.38)	92,2 (3.63)	53,7 (2.11)		
PHM 20•19	112,4 (4.43)	93,4 (3.68)	54,9 (2.16)		
PHM 20•20	115,5 (4.55)	96,5 (3.80)	58 (2.28)		
PHM 20•23	118,8 (4.682)	99,8 (3.93)	61,3 (2.41)		
PHM 20•24,5	121,1 (4.77)	102,1 (4.02)	63,6 (2.50)		
PHM 20•25	123,5 (4.86)	104,5 (4.11)	66 (2.60)		
PHM 20•27,8	126,2 (4.97)	107,2 (4.22)	68,7 (2.70)		
PHM 20•31,5	133,5 (5.26)	114,5 (4.51)	76 (2.99)		

Replaces: 05/02.2018

o 06/12.2022

KAPPA 30 CSK — GEAR MOTOR DIMENSIONS — PRV-REVP-V8/V11

Configuration shown:
Clockwise rotation CRD
Proportional relief valve
Reverse valve
Anti-cavitation valve



V8 anti-cavitation valve available with type 22-27-31-34-38
V11 anti-cavitation valve available with type 41-43-46-51-56

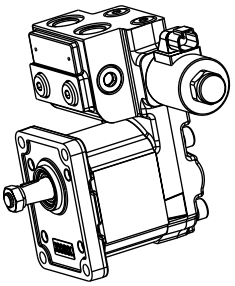
X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

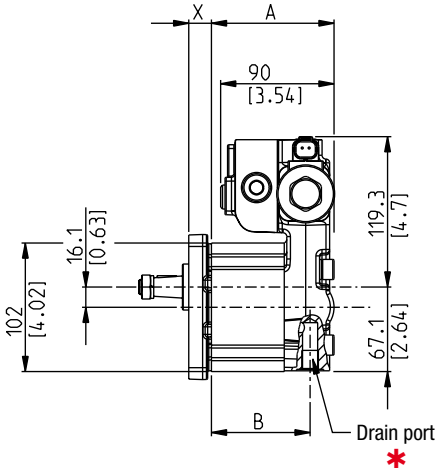
Motor type	A	B	C	D	E	IN/OUT Ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	Gas BSPP	SAE ODT
KM 30•22	87,5 (3.44)	68 (2.68)	61 (2.40)	23 (0.91)	16 (0.63)		
KM 30•27	90,5 (3.56)	71 (2.80)	64 (2.52)	26 (1.02)	19 (0.75)		
KM 30•31	93 (3.66)	73,5 (2.89)	66,5 (2.62)	28,5 (1.12)	21,5 (0.85)		
KM 30•34	95,5 (3.76)	76 (2.99)	69 (2.72)	31 (1.22)	24 (0.94)		
KM 30•38	98,5 (3.88)	79 (3.11)	72 (2.83)	34 (1.34)	27 (1.06)	GD/GE	OC/OD
KM 30•41	100 (3.94)	80,5 (3.17)	73,5 (2.89)	35,5 (1.40)	28,5 (1.12)	GE/GF	OD/OF
KM 30•43	101,5 (4.00)	82 (3.23)	75 (2.95)	37 (1.46)	30 (1.18)		
KM 30•46	103 (4.06)	83,5 (3.29)	76,5 (3.01)	38,5 (1.52)	31,5 (1.24)		
KM 30•51	106,5 (4.19)	87 (3.43)	80 (3.15)	42 (1.65)	35 (1.38)		
KM 30•56	109,5 (4.31)	90 (3.54)	83 (3.27)	45 (1.77)	38 (1.50)		

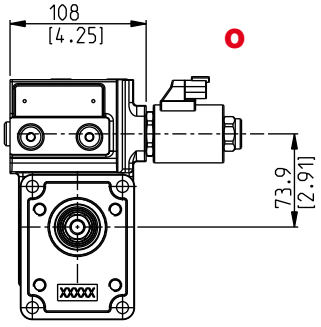
06/12.2022

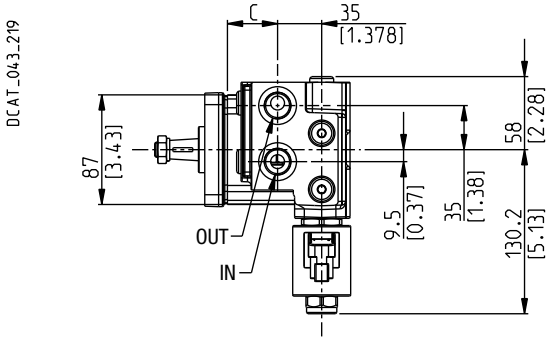
POLARIS 20 — GEAR MOTOR DIMENSIONS — REV/VPIF-SK

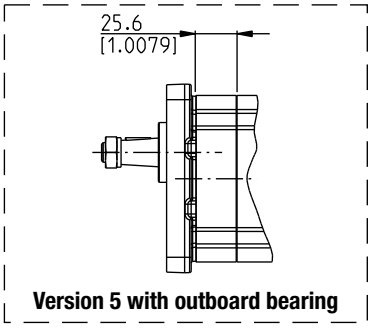
Configuration shown:
Clockwise rotation CRD
Reverse valve
Max. pressure relief valve fixed setting and anti-cavitation











X: For drive shafts, mounting flanges and ports see the POLARIS technical catalogue

Motor type	A	B	C	IN/OUT Ports	
	mm (in)	mm (in)	mm (in)	Gas BSPP	SAE ODT
PLM 20•4	91 (3.58)	72 (2.83)	33,5 (1.32)	GD/GD	OB/OB OC/OC
PLM 20•6,3	93,5 (3.68)	74,5 (2.93)	36 (1.42)		
PLM 20•7,2	94,5 (3.72)	75,5 (2.97)	37 (1.46)		
PLM 20•8	96 (3.78)	77 (3.03)	38,5 (1.52)		
PLM 20•9	97,3 (3.83)	78,3 (3.08)	39,8 (1.57)		
PLM 20•10,5	100 (3.94)	81 (3.19)	42,5 (1.67)		
PLM 20•11,2	100,5 (3.96)	81,5 (3.21)	43 (1.69)		
PLM 20•14	105,5 (4.15)	86,5 (3.41)	48 (1.89)		
PLM 20•16	109 (4.29)	90 (3.54)	51,5 (2.03)		
PLM 20•19	112,4 (4.43)	93,4 (3.68)	54,9 (2.16)		
PLM 20•20	115,5 (4.55)	96,5 (3.80)	58 (2.28)		
PLM 20•24,5	121,1 (4.77)	102,1 (4.02)	63,6 (2.50)		
PLM 20•25	123,5 (4.86)	104,5 (4.11)	66 (2.60)		
PLM 20•27,8	126,2 (4.99)	107,2 (4.22)	68,7 (2.70)		
PLM 20•31,5	133,5 (5.26)	114,5 (4.51)	76 (2.99)		

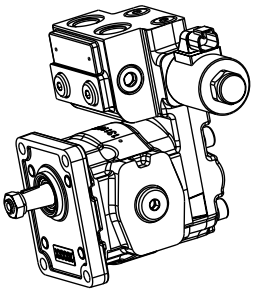
Replaces: 05/02.2018

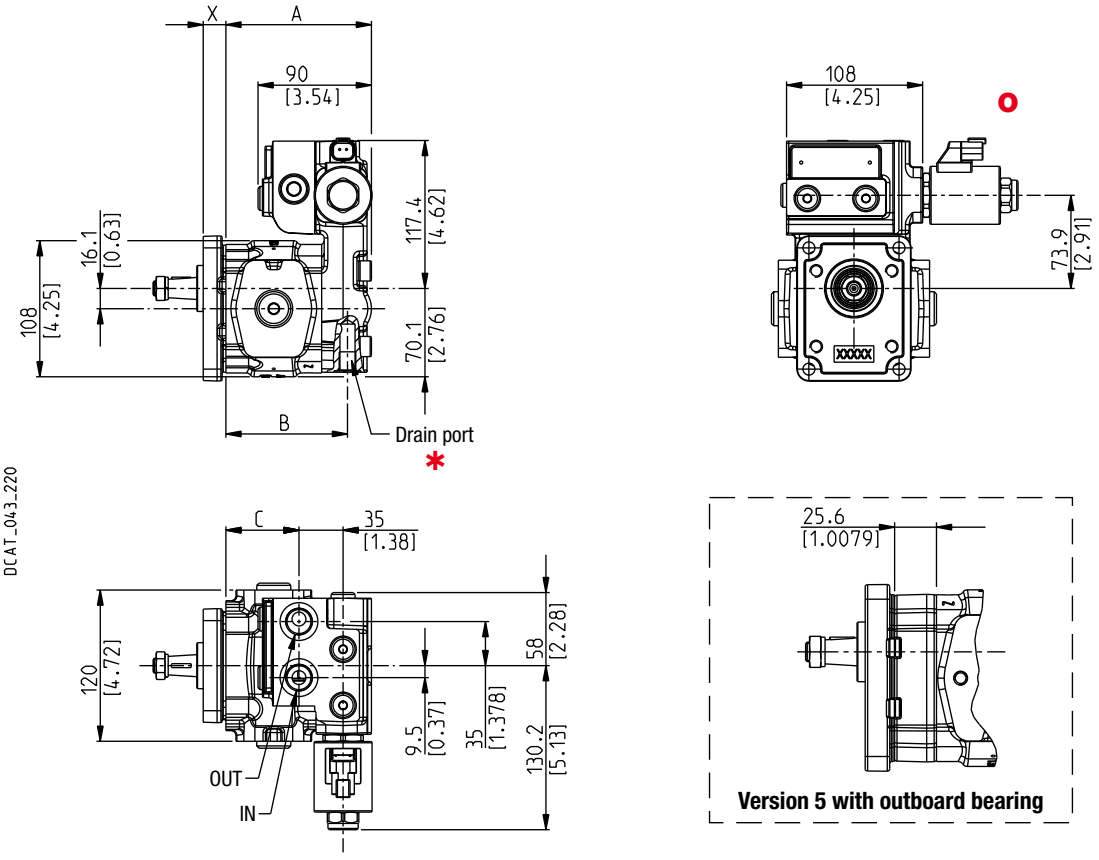
O 06/12.2022

POLARIS PH — GEAR MOTOR DIMENSIONS — REV/VPIF-SK

Replaces: 05/02.2018

Configuration shown:
Clockwise rotation CRD
Reverse valve
Max. pressure relief valve fixed setting
and anti-cavitation





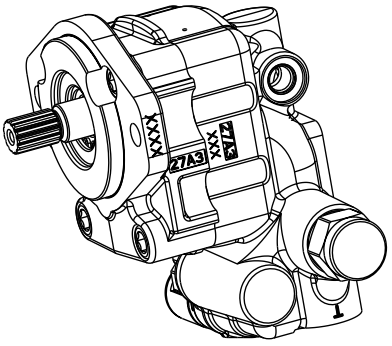
X: For drive shafts, mounting flanges and ports see the POLARIS PH technical catalogue

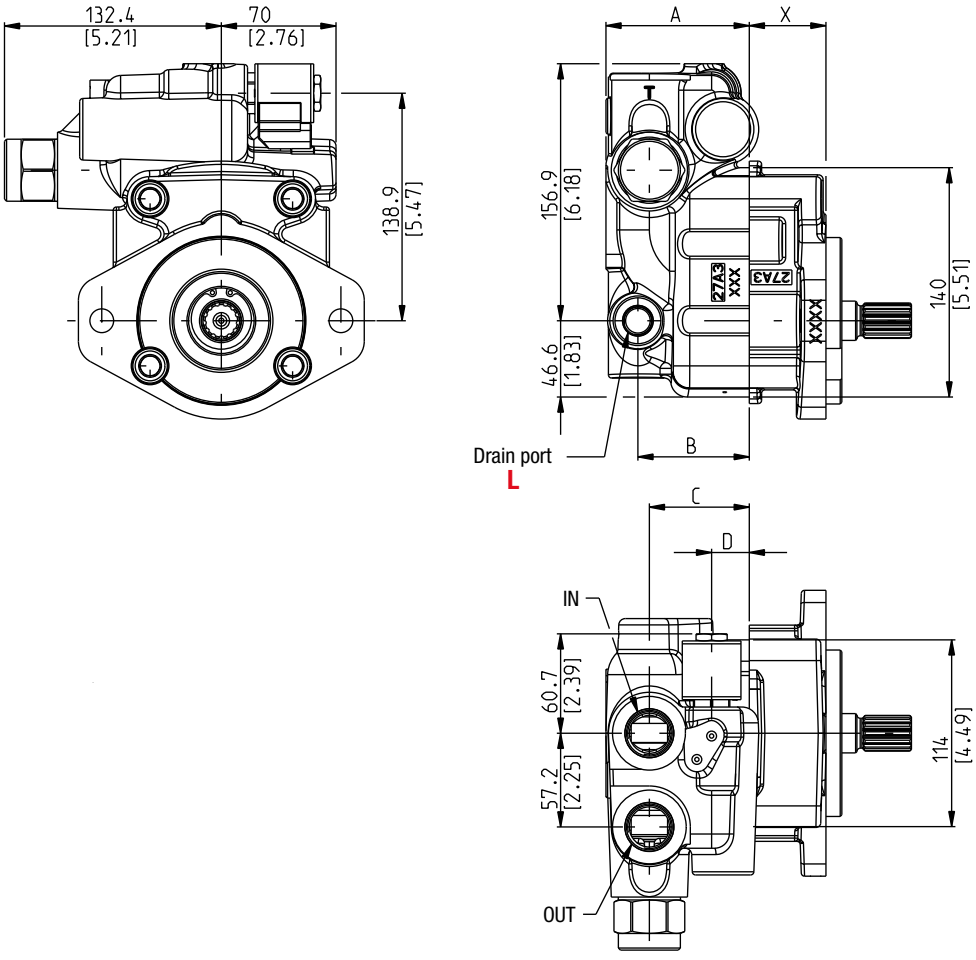
Motor type	A	B	C	IN/OUT Ports	
	mm (inch)	mm (inch)	mm (inch)	Gas BSPP	SAE ODT
PHM 20•8	96 (3.78)	77 (3.03)	38,5 (1.52)	GD/GD	OB/OB OC/OC
PHM 20•10,5	100 (3.94)	81 (3.19)	42,5 (1.67)		
PHM 20•11,2	100,5 (3.96)	81,5 (3.21)	43 (1.69)		
PHM 20•14	105,5 (4.15)	86,5 (3.41)	48 (1.89)		
PHM 20•16	109 (4.29)	90 (3.54)	51,5 (2.03)		
PHM 20•18	111,2 (4.38)	92,2 (3.63)	53,7 (2.11)		
PHM 20•19	112,4 (4.43)	93,4 (3.68)	54,9 (2.16)		
PHM 20•20	115,5 (4.55)	96,5 (3.80)	58 (2.28)		
PHM 20•23	118,8 (4.682)	99,8 (3.93)	61,3 (2.41)		
PHM 20•24,5	121,1 (4.77)	102,1 (4.02)	63,6 (2.50)		
PHM 20•25	123,5 (4.86)	104,5 (4.11)	66 (2.60)		
PHM 20•27,8	126,2 (4.97)	107,2 (4.22)	68,7 (2.70)		
PHM 20•31,5	133,5 (5.26)	114,5 (4.51)	76 (2.99)		

O 06/12.2022

KAPPA 30 - CSK — GEAR MOTOR DIMENSIONS — REVP/VPIF

Configuration shown:
Clockwise rotation CRD
Reverse valve
Max. pressure relief valve fixed setting
and anti-cavitation





X: For drive shafts, mounting flanges and ports see the KAPPA 30 technical catalogue and page 65

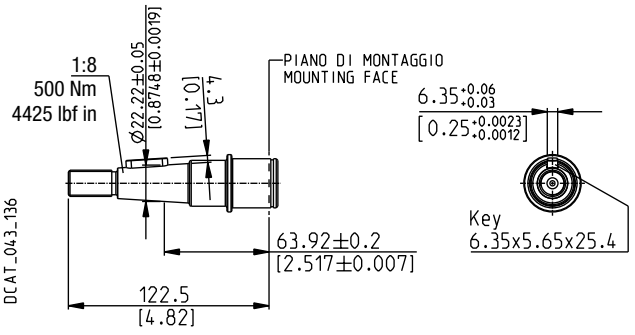
Motor type	A	B	C	D	IN/OUT Ports	
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	Gas BSPP	SAE ODT
KM 30•22	87,5 (3.44)	68 (2.68)	61 (2.40)	23 (0.91)		
KM 30•27	90,5 (3.56)	71 (2.80)	64 (2.52)	26 (1.02)		
KM 30•31	93 (3.66)	73,5 (2.89)	66,5 (2.62)	28,5 (1.12)		
KM 30•34	95,5 (3.76)	76 (2.99)	69 (2.72)	31 (1.22)		
KM 30•38	98,5 (3.88)	79 (3.11)	72 (2.83)	34 (1.34)	GD/GE	OC/OD
KM 30•41	100 (3.94)	80,5 (3.17)	73,5 (2.89)	35,5 (1.40)	GE/GF	OD/OF
KM 30•43	101,5 (4.00)	82 (3.23)	75 (2.95)	37 (1.46)		
KM 30•46	103 (4.06)	83,5 (3.29)	76,5 (3.01)	38,5 (1.52)		
KM 30•51	106,5 (4.19)	87 (3.43)	80 (3.15)	42 (1.65)		
KM 30•56	109,5 (4.31)	90 (3.54)	83 (3.27)	45 (1.77)		

06/12.2022

KAPPA 30 ADDITIONAL DRIVE SHAFTS

STRAIGHT	IS

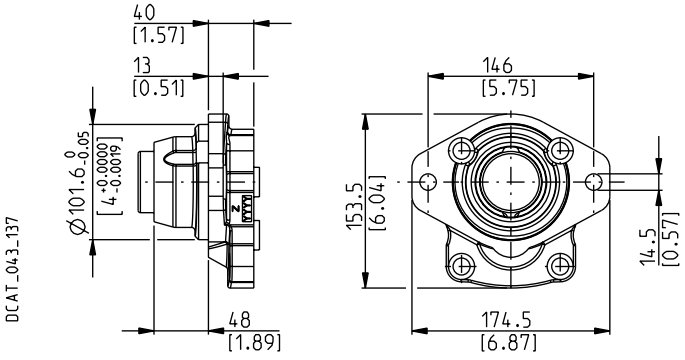
Mounting face refer to flange code **WZ**



KAPPA 30 ADDITIONAL MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE “B” 2 HOLES
WZ

Conforms to SAE J744



	DRIVE SHAFTS
VERSIONS See page 41	**IS**
3	■

■ Standard combination

06/12.2022

HOW TO ORDER - POLARIS 20 AND POLARIS PH 20 GEARS MOTORS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PLM 20•4	L	0	-	82	E2	-	L	GD/GD	-	N	-	E	-	D	-	*	GB	-	REV...	-	SK	(CRS)

O

1	Type (a)	Motor type
Polaris 20		PLM 20•4
Polaris PH 20		PHM 20•8

2	Rotation	Code
Reversible side external drain		L

3	Outboard bearing options	Code
Without outboard bearing		0
With outboard bearing		5

4	Drive shaft (b)	Code

5	Mounting flange (b)	Code

6	Ports position	Code
Side		L

7	Ports IN/OUT (b)	Code

8	Seals (c)	Code
Buna N (standard)		N
Buna hydrogenated HNBR and viton shaft seal		T-PV

9	Cover options	Code
Cast iron mounting flange and rear cover (standard - no code) (d)		
Aluminium mounting flange and cast iron rear cover (d)		E
Cast iron mounting flange and aluminium rear cover (e)		L
Aluminium mounting flange and rear cover (e)		EL

Code	Shaft seal options	10
D	Standard seal with wiper seal	

Code	Drain port position	11
*	Vertical position	

Code	Drain port (b)	12

Code	Valves (f)	13
V8	Anti-cavitation	
VPIF (...)	Max. pressure relief valve fixed setting	
VMP5 (...)/TS/V9	Max. pressure relief valve adjustable setting and anti-cavitation valve	
UNL ...	ON/OFF two speed valve	
PRV ...	Proportional relief valve	
REV ...	Reverse valve	

Code	Valve options (d)	14
SK	Reverse valve cover	

Code	Rotation control	15
CRS	Anti-clockwise rotation control	
CRD	Clockwise rotation control	

(a) Displacements on page 36.

(b) See the technical catalogues of each specific series.

(c) Choose the seals according to the temperature shown on page 34.

(d) Only for reverse valve.

(e) Not available for reverse valve.

(f) How to order see page 6 ÷ 15.

Replaces: 05/02.2018

O 06/12.2022

HOW TO ORDER - KAPPA 30 GEARS MOTORS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
KM 30•22	L	3	-	IS	WZ	-	L	GD/GE	-	N	-	D	-	L	GC	-	REVP...	-	CSK	-	(CRS)	-	VNR01

1	Type (a)	Motor type
Kappa 30		KM 30•22

2	Rotation	Code
Reversible side external drain		L

3	Outboard bearing options	Code
Without outboard bearing		0
With outboard bearing		3
With outboard bearing		6

4	Drive shaft (b)	Code

5	Mounting flange (b)	Code

6	Ports position	Code
Side		L

7	Ports IN/OUT	Code

8	Seals (c)	Code
Buna N (standard)		N
Buna hydrogenated HNBR and viton shaft seal		T-PV

9	Shaft seal options	Code
Standard seal with wiper seal		D

10	Drain port position	Code
Vertical position		*
Side position (d)		L

Code	Drain port (b)	11

Code	Valves (e)	12
V8	Anti-cavitation available with type 22-27-31-34-38	
V11	Anti-cavitation available with type 41-43-46-51-56	
VPIF (...)	Max. pressure relief valve fixed setting	
VPIR ...	Max. pressure relief valve adjustable setting and anti-cavitation valve	
VPIR ...	ON/OFF two speed valve	
PRV ...	Proportional relief valve	
REVP ...	Reverse valve	

Code	Body design	13
HSC	Only with speed sensor withot valves	
HSY	For anti-cavitation valve, max. pressure relief valve fixed setting and max. pressure relief valve adjustable setting	
CSZ	For max. pressure relief valve adjustable setting	
CSK	For reverse valve	

Code	Rotation control	14
CRS	Anti-clockwise rotation control	
CRD	Clockwise rotation control	

Code	Painting	15
...	Without painting (standard) no code	
VNR01	Black painting (f)	
VGR01	Grey painting (f)	

(a) Displacements on page 37.

(b) See the respective technical catalogue. Additional shaft and mounting flange on page 65.

(c) Choose the seals according to the temperature shown on page 34.

(d) Only for reverse valve.

(e) How to order see page 6 ÷ 15.

(f) Salt spray resistance of 300 hours.
Please contact us for more information.

O 06/12.2022

ORDER EXAMPLE

POLARIS 20 motor with ON/OFF two speed valve		ON/OFF two speed valve		Max. pressure valve	Valve rotation control
PLM 20•4 L0-82 E2-L EA/EA-N-EL-D-✱ GB	-	UNL-2-C-M	/	VPIF (160)	(CRS)

POLARIS PH motor with proportional valve		Proportional valve		Anti-cavitation valve	Valve rotation control
PHM 20•8 L5-03 S1-L OC/OC-N-L-D-✱ 03	-	PRV-1-B-180-D	/	V9	(CRD)

O KAPPA 30 motor with proportional valve		Proportional valve		Anti-cavitation valve		Body design	Valve rotation control
KM 30•22 L0-04 S3-L GE/GF-N-D-✱ GC	-	PRV-1-B-180-D	/	V8	/	CSZ	(CRS)

O POLARIS PH motor with proportional and reverse valve		Proportional valve		Reverse valve		Anti-cavitation valve		Valve option	Valve rotation control
PHM 20•8 L0-82 E2-L GD/GD-N-E-D-✱ GB	-	PRV-2-B-180-D	/	REV-2-B-D	/	V8	-	SK	(CRS)

O KAPPA 30 motor with proportional and reverse valve		Proportional valve		Reverse valve		Anti-cavitation valve		Valve option	Valve rotation control
KM 30•22 L3-IS WZ-L GD/GE-N-D-L GC	-	PRV-2-B-230-D	/	REVP-2-B-D	/	V8	-	CSK	(CRD)

Replaces: 05/02.2018

O 06/12.2022

NOTES

06/12.2022

NOTES

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FD 06 T A Edition: 06/12.2022 Replaces: FD 0 5 T A

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