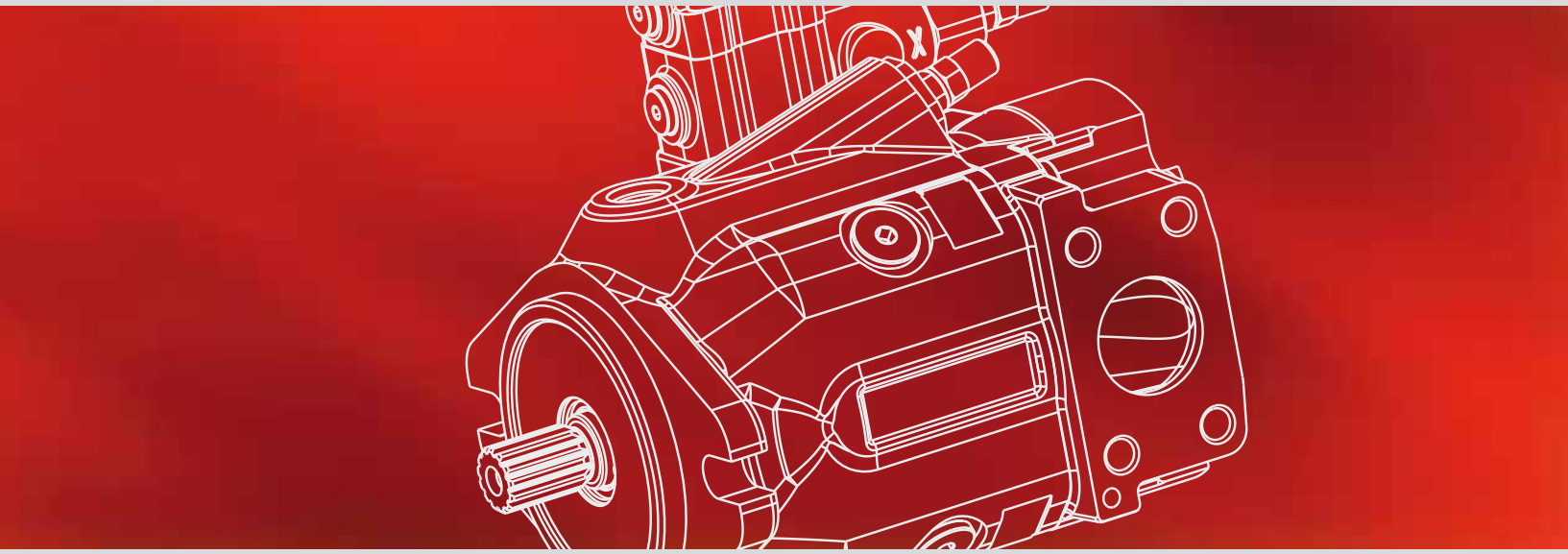
PRELIMINARY
FOR INTERNAL USE ONLY

CASAPPA®
FLUID POWER DESIGN



VARIABLE DISPLACEMENT AXIAL PISTON PUMPS

MVPD

FEATURES

More power and reduced dimensions are the main features of the new series of axial piston pumps with variable displacement swash plate “MVPD”.
The manufacturers of mobile machines must comply with the new more restrictive rules on emission standards which imposes the reduction of consumption, the increase in power and reduction of the overall dimensions of the machine. The “MVPD” pumps allow higher flow rates than traditional pumps with same dimensions, higher machine speeds without affecting the design of the hydraulic system and a high power-to-dimensions ratio.

DISPLACEMENTS
Up to 65 cm^3/rev (3.97 in^3/rev)

PRESSURE
Max. continuous 230 bar (3335 psi)
Max. intermittent 260 bar (3770 psi)
Max. peak 290 bar (4205 psi)

SPEED
Max. 3700 min^{-1}

APPLICATION
Medium pressure

SECTOR
Mobile

TIPICAL APPLICATIONS
- Telehandlers
- Forklifts
- Fan Drive Systems
- Tractors
- Agricultural Applications

- High performances
- Higher speed
- Higher power-to-weight ratio
- Longer service life
- Low noise emission
- Cost-optimized design
- Max. and min. displacement limiter
- Drive shaft bearing suitable for radial and axial loads
- Hydraulic and Electro-hydraulic controls
- Short response times

DIRECTION OF ROTATION
Clockwise or anti-clockwise defined looking at the drive shaft.

HYDRAULIC FLUID
Mineral oil based hydraulic fluid conforming to DIN 51524. The system should be designed to prevent aeration of the hydraulic fluid.

FLUID VISCOSITY
The fluid viscosity range for optimal use of MVPD pump is between 15 and 35 cSt (77 and 163 SSU).
Functional limit conditions are:
max.: 1500 cSt (6818 SSU) at start up at -25 °C (-13 °F) with straight and short inlet line.
min.: 10 cSt (58 SSU) at maximum temperature of 110 °C (230 °F)

FILTRATION
To ensure the optimal performance and the maximum life to the pump, the hydraulic fluid must have and maintain a fluid contamination within the values shown in the table below.

Working pressure bar (psi)	Δp < 140 (2030)	140 < Δp < 210 (2030) (3045)	Δp > 210 (3045)
Contamination class NAS 1638	9	8	7
Contamination class ISO 4406:1999	20/18/15	19/17/14	18/16/13
Achieved with filter $\beta x_{(c)} \geq 75$ according to ISO 16889	10 µm	10 µm	10 µm

FILL WITH OIL BEFORE START-UP

Casappa recommends to use its own production filters:

IKRON® Fluid Filtration

01/10.2013

TECHNICAL DATA

Technical data with mineral oil

HL or **HLP** mineral oil based hydraulic fluid to DIN 51524

Pump type MVPD			30·34	30·45	48·60 (1)	48·65 (1)
Max. displacement (theor.) V_{max}	cm^3/rev (in^3/rev)		34 (2.07)	45 (2.75)	60 (3.66)	65 (3.97)
Inlet pressure	bar abs. (in Hg)	min.	0.8 (24)			
	bar abs. (psi)	max.	25 (363)			
Max. outlet pressure p_{max}	bar (psi)	continuous	230 (3335)			
		intermittent	260 (3770)			
		peak	290 (4205)			
Max. drain line pressure	bar abs. (psi)		1,5 (22)			
Max. speed n_{max}	min^{-1}	@ V_{max} (2)	3700	3500	2600	2800
Max. delivery (theor.)	l/min (US gpm)	@ n_{max}	126 (33.3)	158 (41.7)	156 (41.2)	182 (48.1)
		@ 2000 min^{-1}	68 (18.0)	90 (23.8)	120 (31.7)	130 (34.3)
		@ 1500 min^{-1}	51 (13.5)	68 (18.0)	90 (23.8)	98 (25.9)
Max. power (theor.) ($\Delta p = p_{max}$ cont.)	kW (HP)	@ n_{max}	48,2 (64.6)	60,4 (80.9)	59,8 (80,1)	69,8 (93.5)
		@ 2000 min^{-1}	26,1 (35.0)	34,5 (46.2)	46 (61,6)	49,8 (66.7)
		@ 1500 min^{-1}	19,6 (26.3)	25,9 (34.7)	34,5 (46.2)	34,7 (50.1)
Max. torque (theor.)	Nm (lbf in)	@ p_{max} cont.	124,5 (1102)	164,7 (1458)	219,6 (1944)	237,9 (2106)
		@ 100 bar (1450 psi)	54,1 (479)	71,6 (634)	95,5 (845)	103,5 (916)
Moment of inertia	kgm^2 (ft^2 lbs)		0,002 (0.05)	0,002 (0.05)	0,003 (0.07)	0,004 (0.09)
Fill volume	l (US gallons)		0,8 (0.21)	0,8 (0.21)	1 (0.26)	0,85 (0.22)
Mass (approx.)	kg (lbs)		16 (35.3)	16 (35.3)	19 (41.9)	19 (41.9)
Seals			N= Buna		V= Viton	
Operating temperature	°C (°F)	min.	-25 (-13)		-15 (5)	
		max. cont.	80 (176)		110 (230)	
		max. peak	100 (212)		125 (257)	

(1) Under development

(2) With an inlet pressure of 1 bar abs (14.5 psi).

Reducing the displacement or increasing the inlet pressure the max. speed change. See table at page 8.

For different working conditions, please consult our technical sales department.

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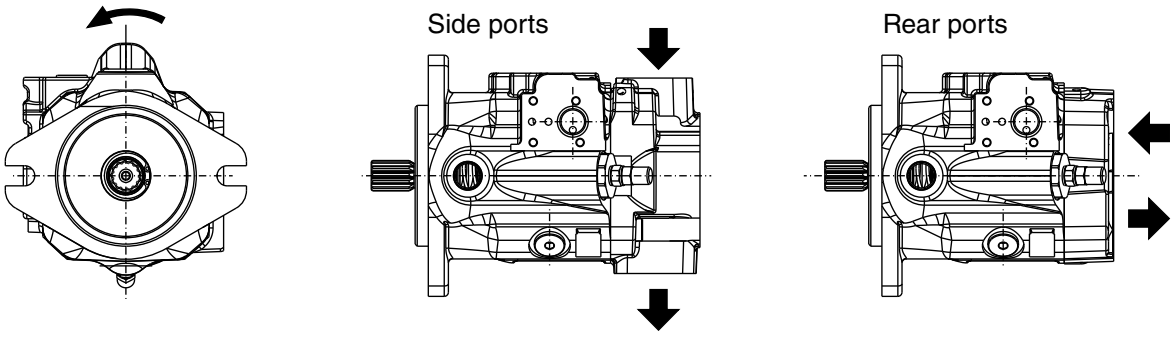
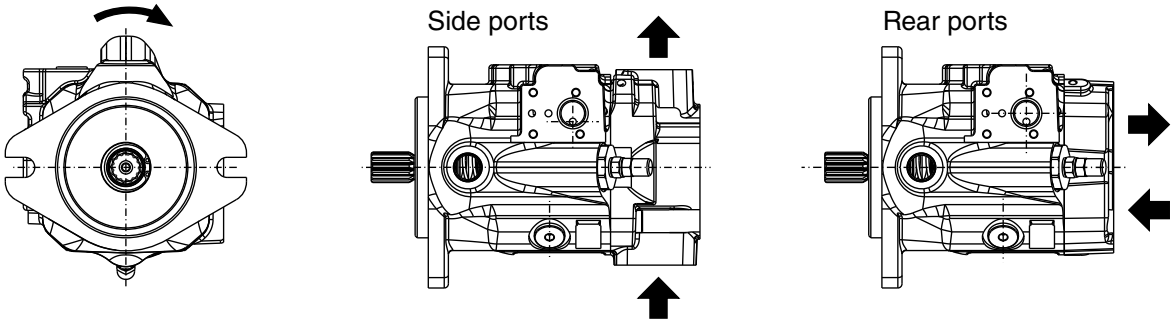
PORTS POSITION

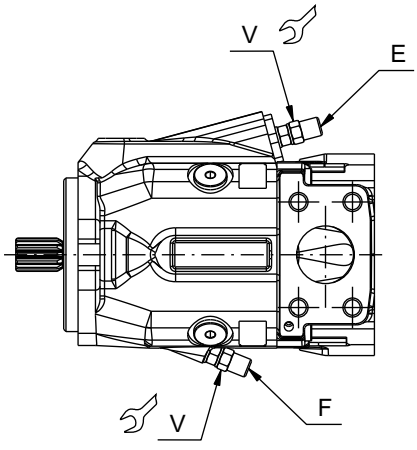
Anti-clock rotation



Clockwise rotation



DISPLACEMENT SETTING



E: Max. displacement limiter
F: Min. displacement limiter
G: Min. and Max. displacement limiter (standard)
V: Tightening torque $10^{\pm 1}$ Nm (80 ÷ 97 lbf in)

			MVPD 30
Max. displacement setting range	cm^3/rev (in^3/rev)	from	22,5 (1.37)
		to	45 (2.75)
Min. displacement setting range	cm^3/rev (in^3/rev)	from	0
		to	22,5 (1.37)
One turn of screw changes pump displacement by approximately	cm^3/rev (in^3/rev)	E	3,9 (0.24)
		F	3,4 (0.21)

For different setting ranges, please consult our technical sales department.

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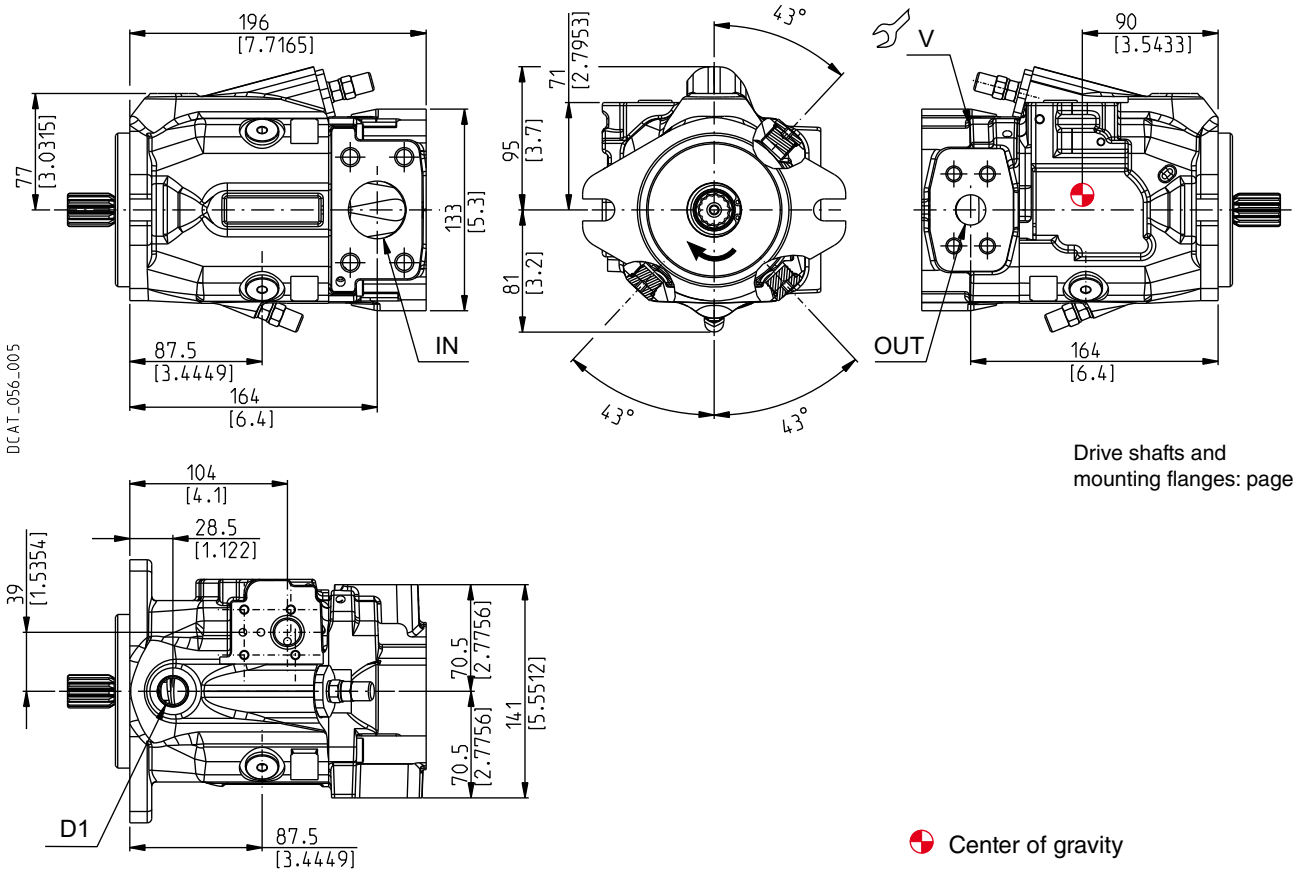
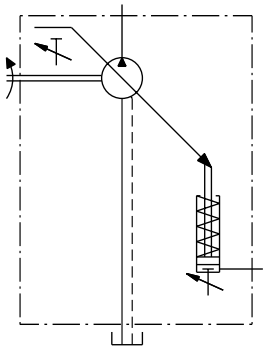
MVPD30 SIDE PORTS - DIMENSIONS L



Drive shafts and mounting flanges: page 9

Center of gravity



Screws tightening torque Nm (lbf in)
V
70 ±7 (558 ÷ 682)

Ports (Nominal size)		
IN	**OUT**	**D1**
1” 1/2	3/4”	Drain port

Dimensions at page 10 ÷ 11

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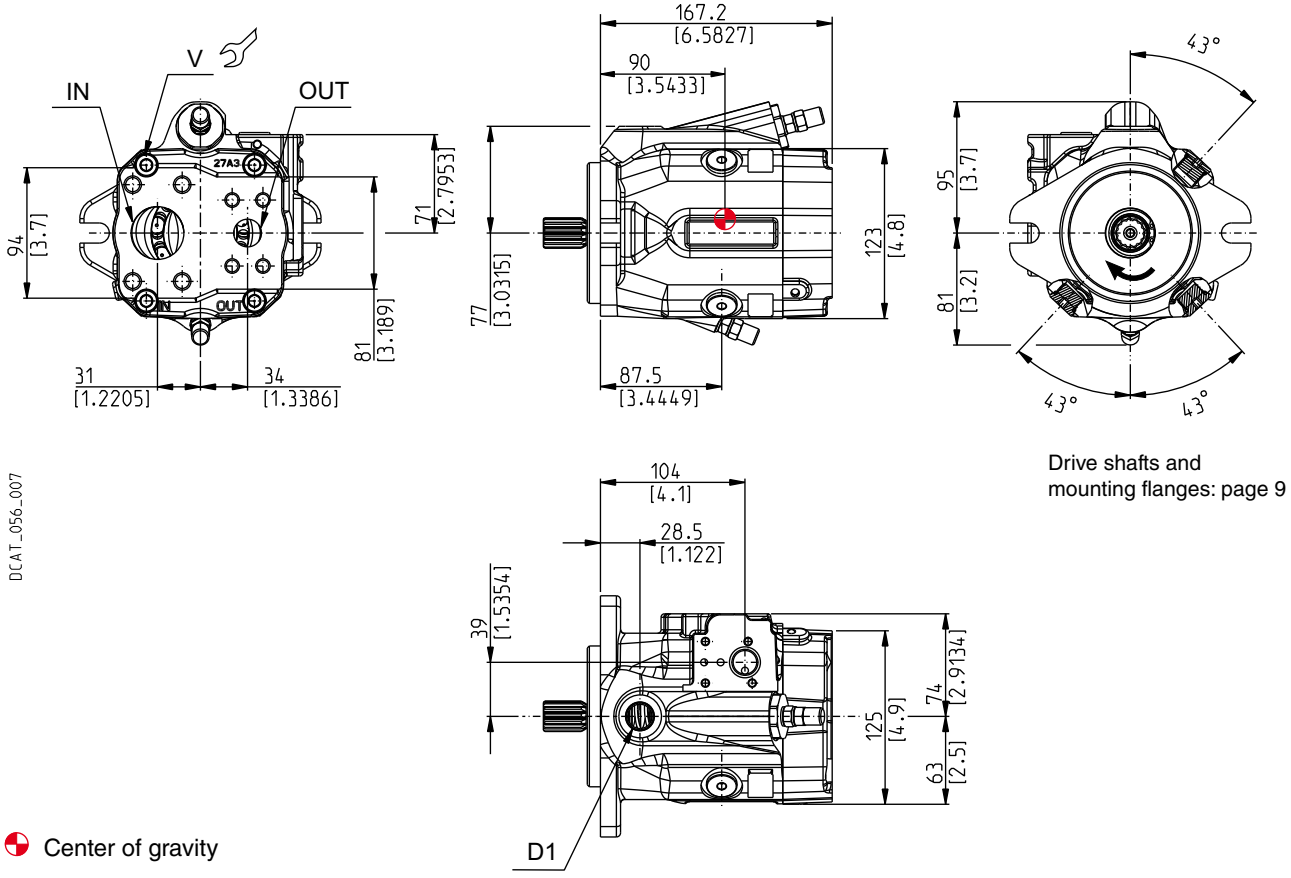
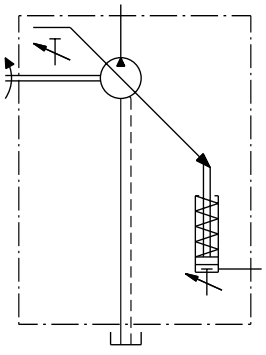
MVPD30 REAR PORTS - DIMENSIONS P



Drive shafts and mounting flanges: page 9

Center of gravity



Screws tightening torque Nm (lbf in)
V
70 ±7 (558 ÷ 682)

Ports (Nominal size)		
IN	**OUT**	**D1**
1” 1/2	3/4”	Drain port

Dimensions at page 10 ÷ 11

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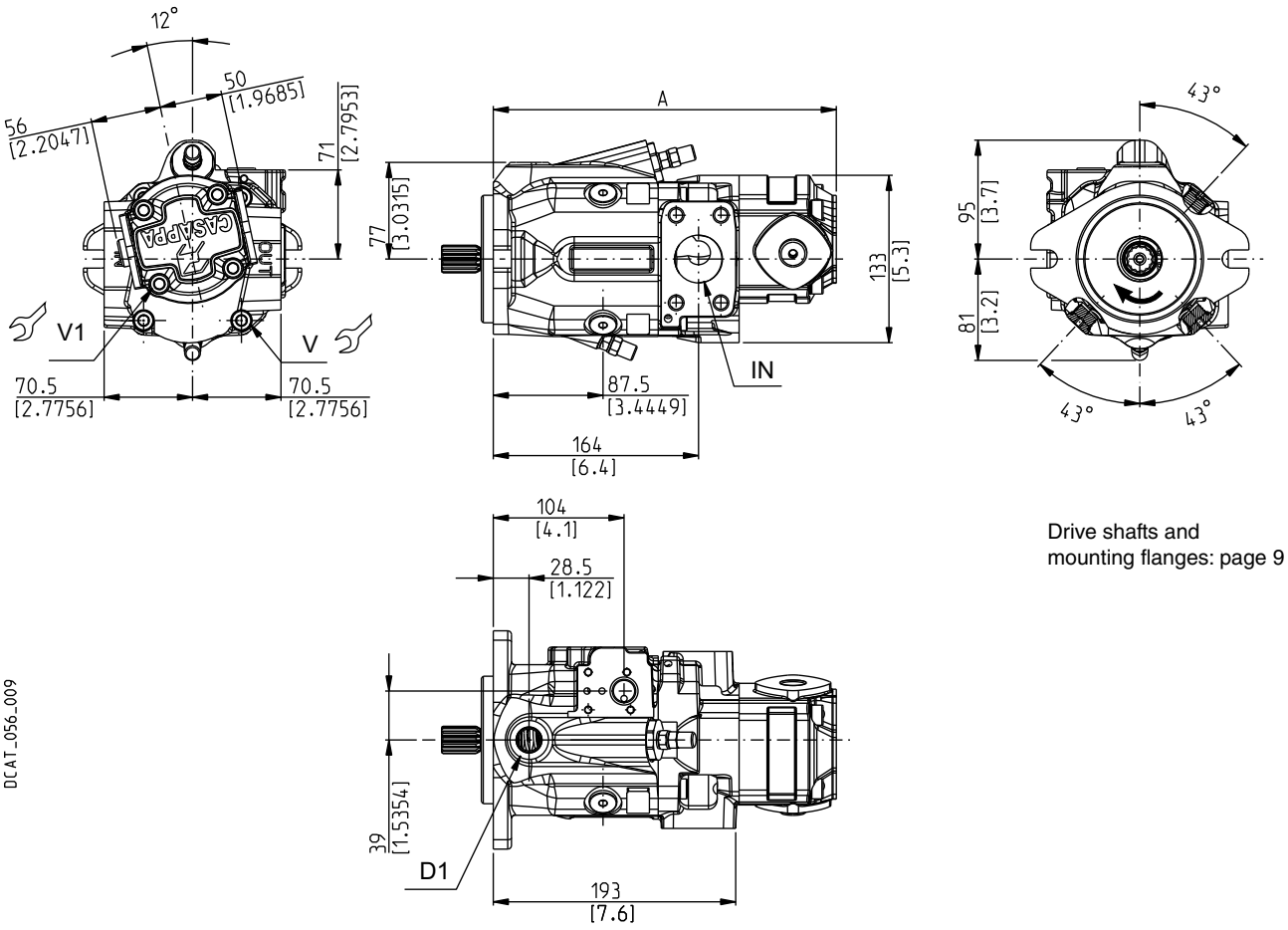
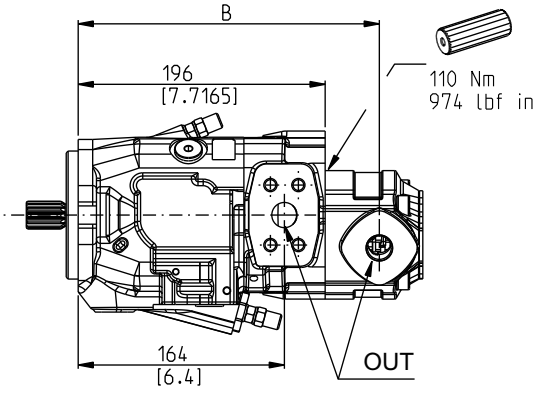
MVPD30/KP20 MULTIPLE PUMPS - DIMENSIONS L

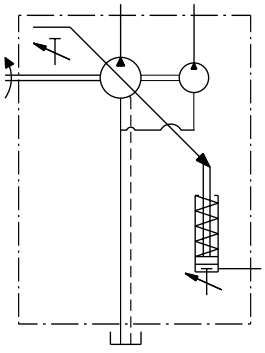


Drive shafts and mounting flanges: page 9

Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	70 ±7 (558 ÷ 682)





Ports (Nominal size)

IN	OUT		D1
MVPD	MVPD	KP20	Drain port
1” 1/2	3/4”	1/2”	

Dimensions at page 10 ÷ 11

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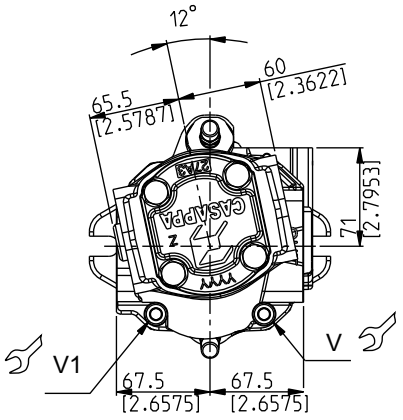
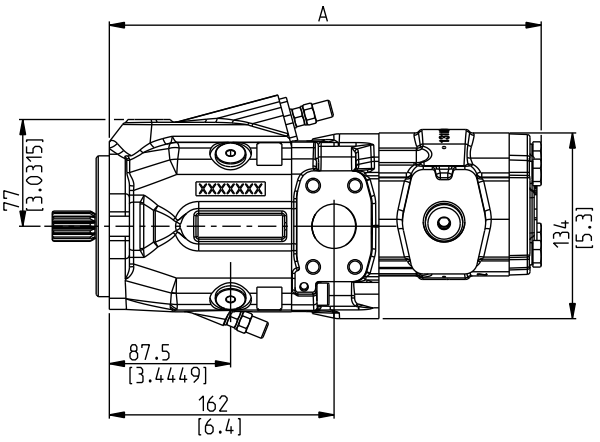
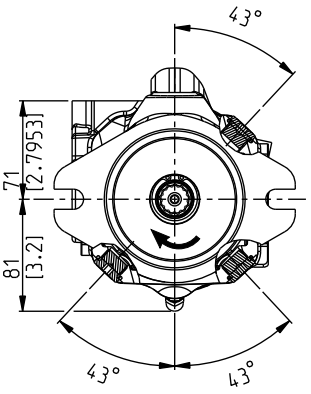
Pump type	Mounting flange	Gear pump KAPPA 20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions	
MVPD30	S5	249 (9.8031)	251,5 (9.9016)	254 (10.0000)	257,5 (10.1378)	261,5 (10.2953)	267 (10.5118)	273,5 (10.7677)	mm (in)	A
		220 (8.6614)	222,5 (8.7598)	225 (8.8583)	228,5 (8.9961)	227 (8.9370)	232,5 (9.1535)	239 (9.4094)	mm (in)	B

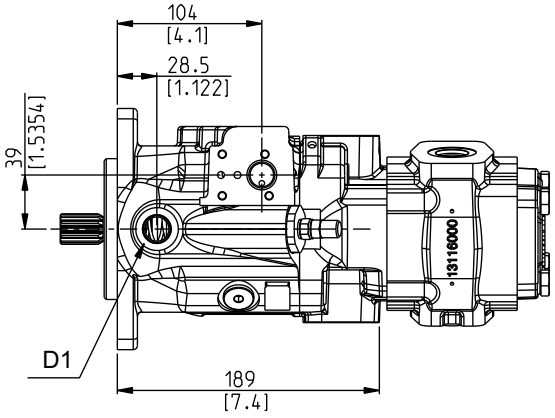
MVPD30/PHP20 MULTIPLE PUMPS - DIMENSIONS L







Drive shafts and mounting flanges: page 9

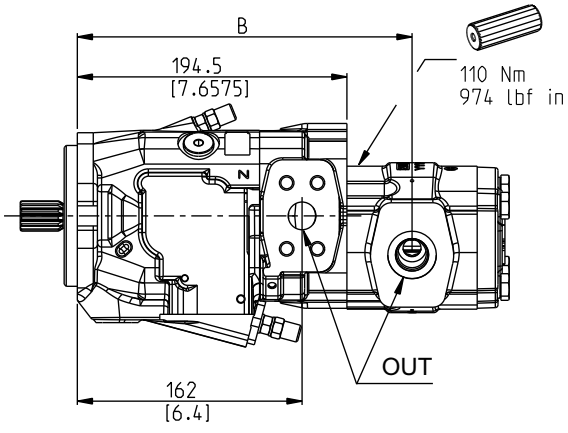


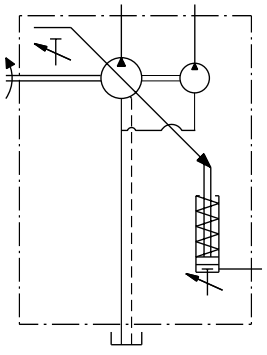
Also available in combination with PLP20

DCAT_056_010

Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	70 ±7 (558 ÷ 682)





Ports (Nominal size)

IN	OUT		D1
MVPD	MVPD	PHP20	Drain port
1” 1/2	3/4”	1/2”	

Dimensions at page 10 ÷ 11

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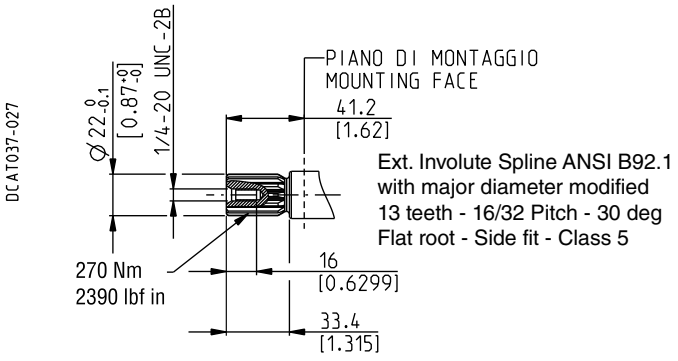
Gear pump POLARIS PH

Pump type	Mounting flange	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions	
MVPD30	S5	294 (23.0000)	297,1 (11.6969)	300,4 (11.8268)	302,7 (11.9173)	305,1 (12.0118)	307,8 (12.1181)	315,1 (12.4055)	mm (in)	A
		232,45 (9.1516)	234 (9.2126)	235,65 (9.2776)	236,8 (9.3228)	238 (9.3701)	239,35 (9.4232)	243 (9.5669)	mm (in)	B

MVPD30 DRIVE SHAFTS / MOUNTING FLANGES

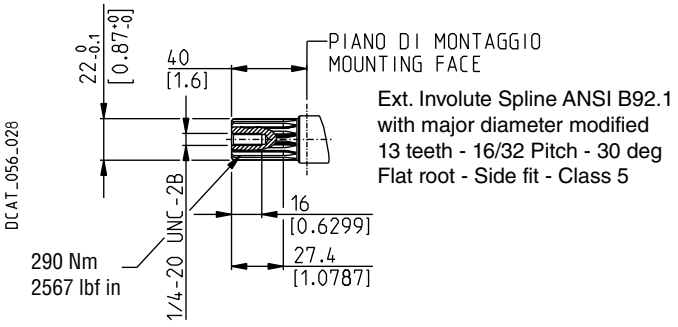
SAE "B" SPLINE 04

Mounting face refers to flange code **S5**



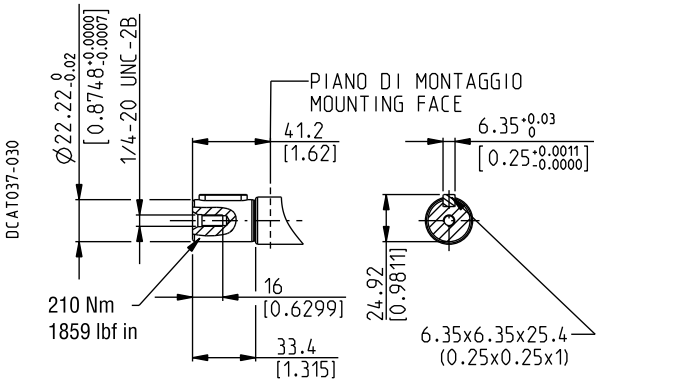
SAE "B" SPLINE 4R

Mounting face refers to flange code **S5**



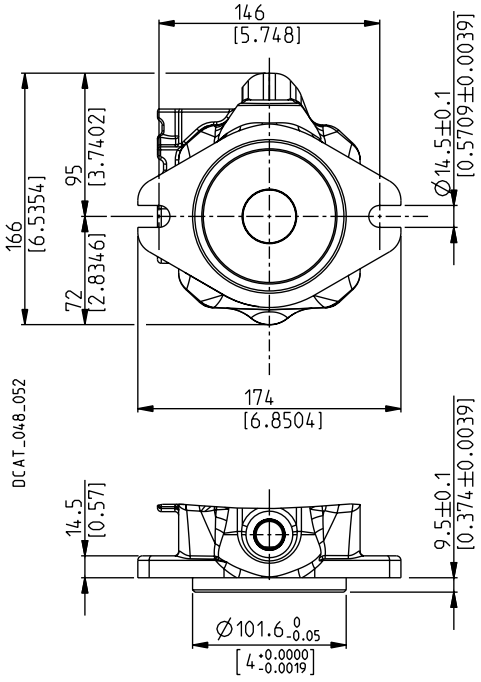
SAE "B" STRAIGHT 32

Mounting face refers to flange code **S5**



SAE "B" 2 HOLES S5

Conforms to SAE J744



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PORTS SIZES

Ports type	INLET / OUTLET PORTS				DRAIN PORTS		LOAD SENSING PORTS		KP20 / PHP20 GEAR PUMPS	
	Split SSM		Split SSS		Gas BSPP	SAE ODT (●)	Gas BSPP	SAE ODT (●)	Gas BSPP	SAE ODT
	IN	OUT	IN	OUT	D1	D1	X	X	OUT	OUT
MVPD 30	ME	MB	SE	SB	—	OB	GA	03	GD	OC

(●) Available only with inlet and outlet ports type Split SSS and SAE ODT.

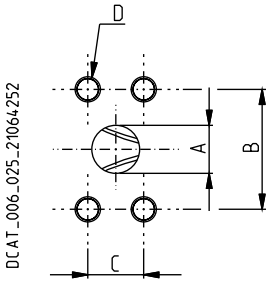
Tightening torque for low pressure side port

Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]

SAE FLANGED PORTS J518 - Standard pressure series 3000 psi — SSM

Metric thread ISO 60° conforms to ISO/R 262

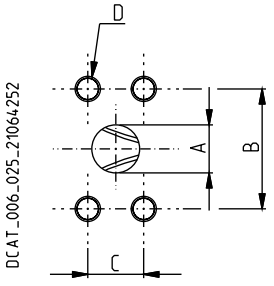
CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
MB	3/4”	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	M 10 17 (0.6693)	—	45 +2,5 (398 ÷ 420)
ME	1” 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	M 12 20 (0.7874)	30 +2,5 (266 ÷ 288)	—



SAE FLANGED PORTS J518 - Standard pressure series 3000 psi — SSS

American straight thread UNC-UNF 60° conforms to ANSI B 1.1

CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
SB	3/4”	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	3/8 - 16 UNC-2B 17 (0.6693)	—	30 +2,5 (266 ÷ 288)
SE	1” 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	1/2 - 13 UNC-2B 20 (0.7874)	30 +2,5 (266 ÷ 288)	—



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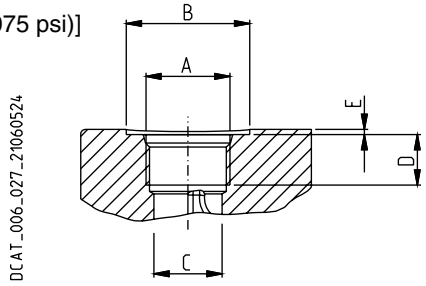
PORTS SIZES

Tightening torque for low pressure side port

Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]

SAE STRAIGHT THREAD PORTS J514 — ODT

American straight thread UNC-UNF 60° conforms to ANSI B 1.1

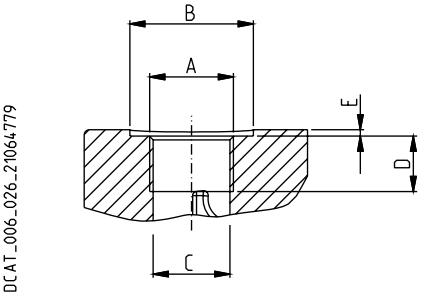


CODE	Nominal size	A	Ø B	Ø C	D	E		
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
03 (X)	1/4”	7/16” - 20 UNF - 2B	—	9,5 (0.3740)	—	—	—	12 +1 (106 ÷ 115)
0B (●)	1/2”	3/4” - 16 UNF - 2B	33 (1.2992)	17, (1.3780)	—	1 (0.0394	20 +1 (177 ÷ 186)	
0C (◆)	5/8”	7/8” - 14 UNF - 2B	34 (1.3386)	20,5 (0.8071)	17 (0.6693)	0,5 (0.0197)	—	70 +5 (620 ÷ 664)

(X) = Load sensing port
(●) = Drain port
(◆) = KP20 / PHP20 outlet port

GAS STRAIGHT THREAD PORTS — BSPP

British standard pipe parallel (55°) conforms to UNI - ISO 228



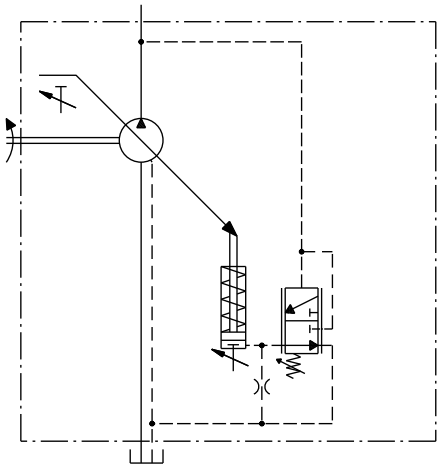
CODE	Nominal size	A	Ø B	Ø C	D	E		
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
GA (X)	1/8”	G 1/8	—	8,75 (0.3444)	12 (0.4724)	—	—	5 +0,25 (44 ÷ 46)
GD (◆)	1/2”	G 1/2	—	19 (0.7480)	17 (0.6693)	—	—	50 +2,5 (443 ÷ 465)

(X) = Load sensing port
(◆) = KP20 / PHP20 outlet port

01/10.2013

PRESSURE COMPENSATOR RP0

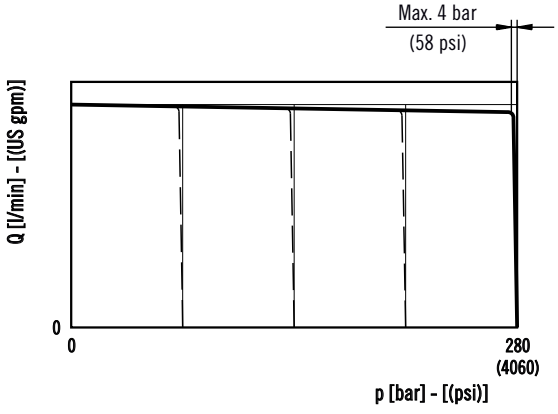
Regulates the pump displacement automatically to mantain the pressure below the fixed pre-adjusted limit.



Compensator type	Pump type	Pressure setting range	Standard setting
		bar (psi)	bar (psi)
RP0	**MVPD30**	20 ÷ 230 (290 ÷ 3335)	230 (3335)

OPERATING CURVES

Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

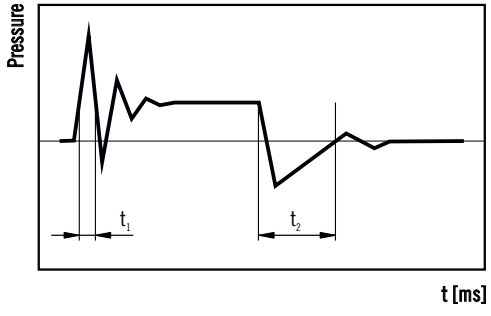


REMOTE CONTROL

For remote pressure compensator LS3 see page 24

RESPONSE AND RECOVERY TIME

According to SAE J745 (using outlet pressure).



	t_1	t_2
Pump type	Response time [ms] (off stroke)	Recovery time [ms] (on stroke)
MVPD30	46	150

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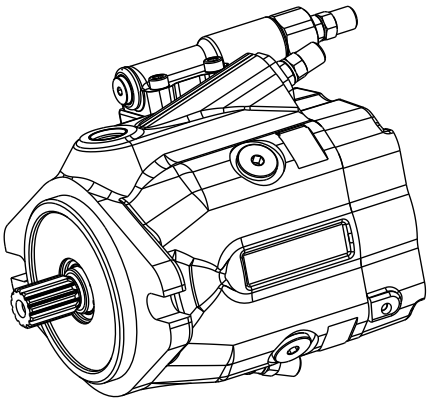
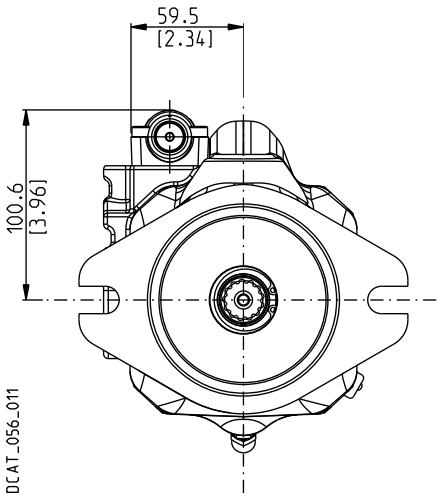
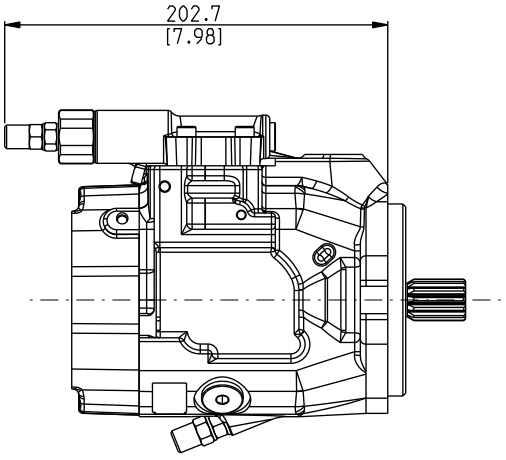
PRESSURE COMPENSATOR RP0





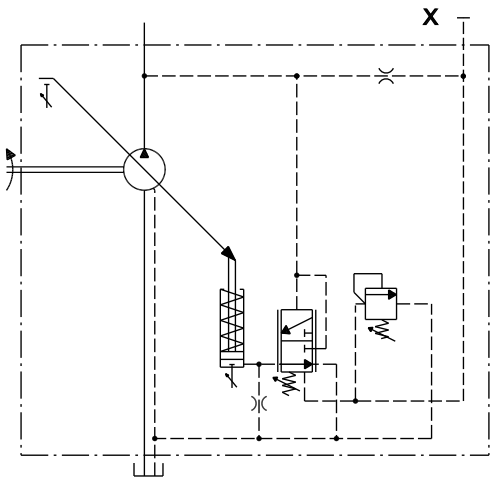


01/10.2013

PRESSURE COMPENSATOR RP1

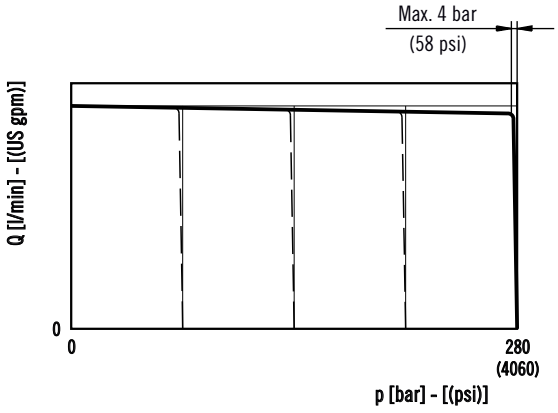
Regulates the pump displacement automatically to mantain the pressure below the fixed pre-adjusted limit.
Designed to work at high frequency ≥ 1 cycle/min

RP1

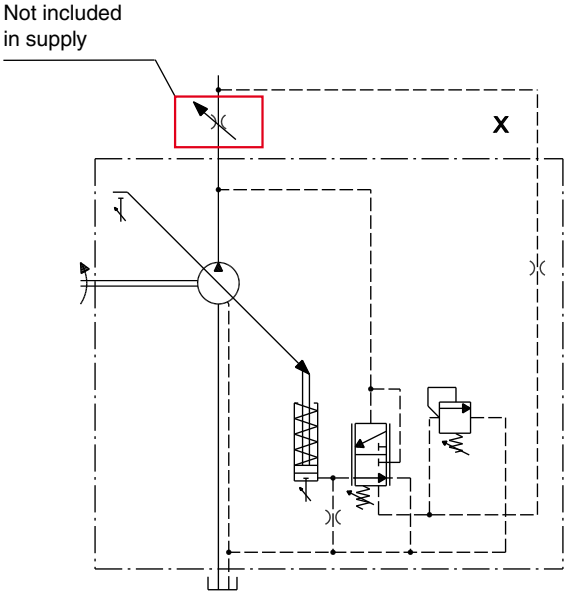


OPERATING CURVES

Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

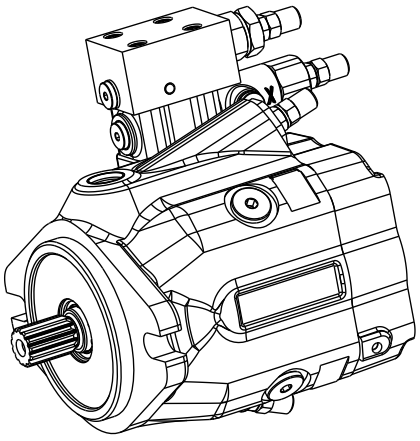


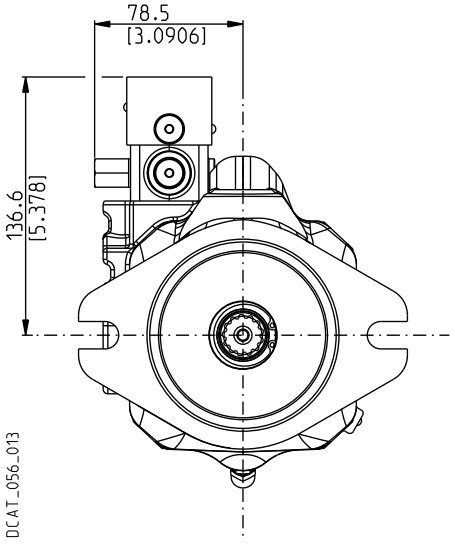
RP1 - LS2 (with flow control)

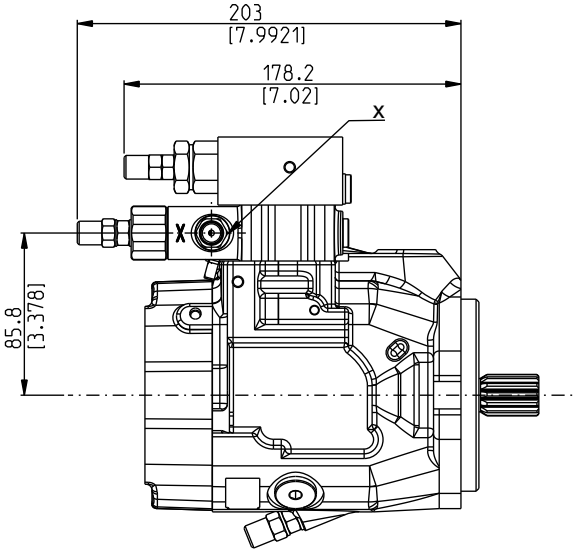


01/10.2013

PRESSURE COMPENSATOR RP1







RP1 - LS2 configuration shown.

X: Load-sensing port. Dimensions at page 10 ÷ 11

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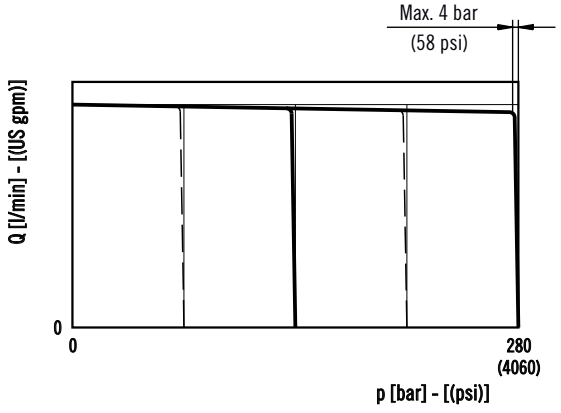
DUAL SETTING PRESSURE COMPENSATOR RP2

Regulates the pump displacement automatically to mantain the pressure below two fixed pre-adjusted limits.
The electrically piloted valve allows to switch between the two different limits.

OPERATING CURVES

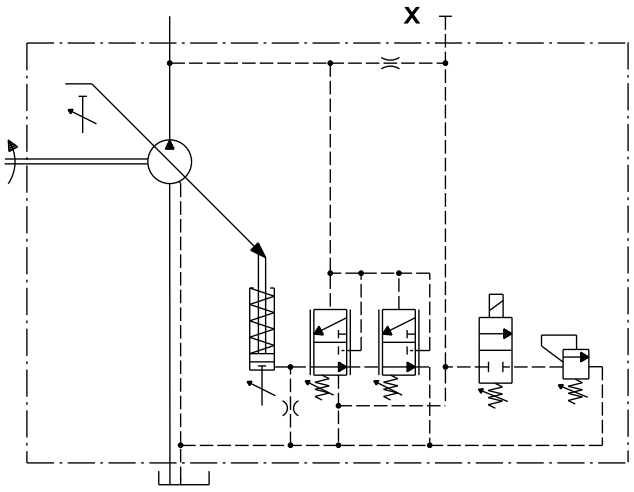
Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).



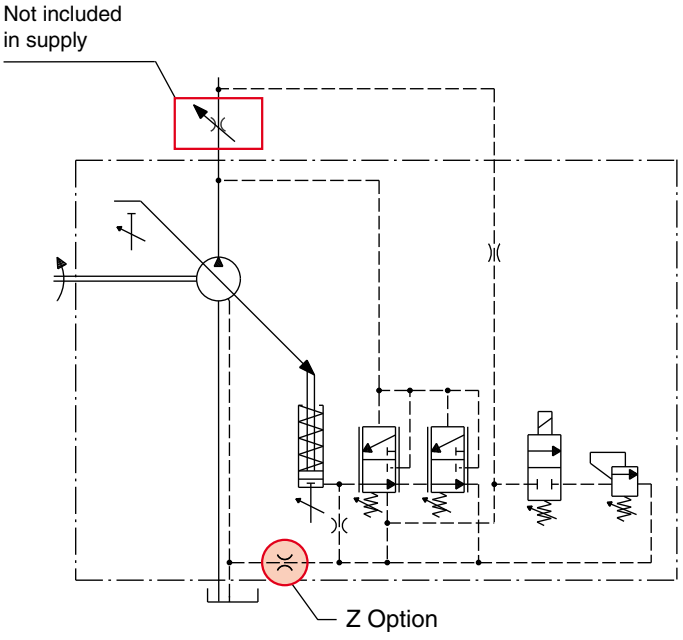
VALVE FEATURES

Valve type	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
3	Normally closed	24 VAC
6	Normally open	12 VDC
7	Normally open	24 VDC
8	Normally open	24 VAC

RP2



RP2 - LS2 (with flow control)



Z Option

Damping restrictor for critical applications.
In case of system instability or pressure oscillations, the additional damping restrictor slows down the pump control system, damping the regulation transients.
The pump regulation response time increases.
The use of the damping restrictor must be evaluated and approved by Casappa technical sales department for the specific application.

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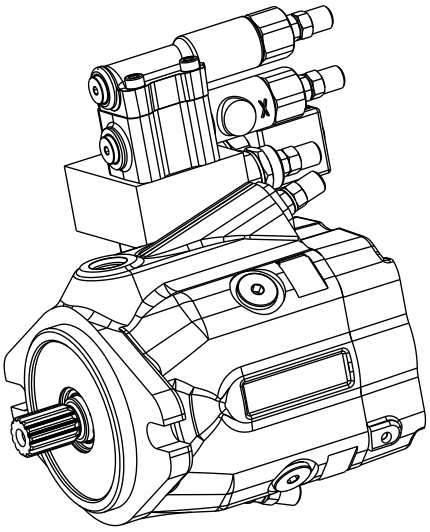
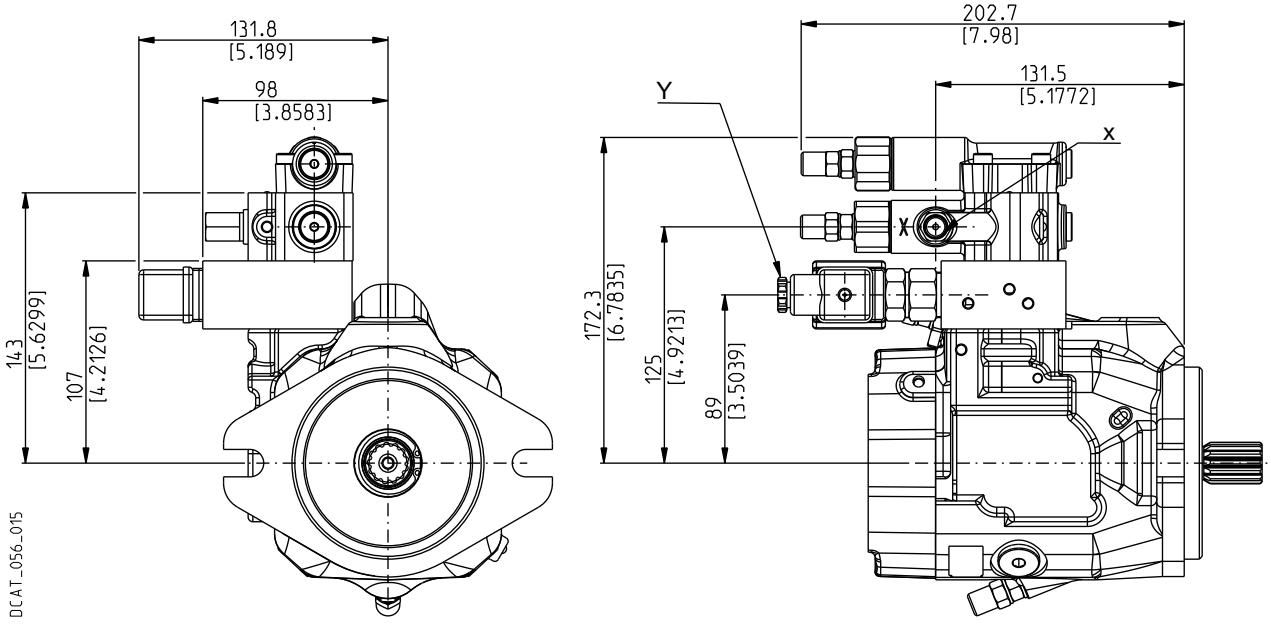
DUAL SETTING PRESSURE COMPENSATOR RP2





RP2 - LS2 configuration shown.

X: Load-sensing port. Dimensions at page 10 ÷ 11
Y: Connector. Standard type DIN 43 650 / ISO 4400. For other connectors please consult our technical sales department.

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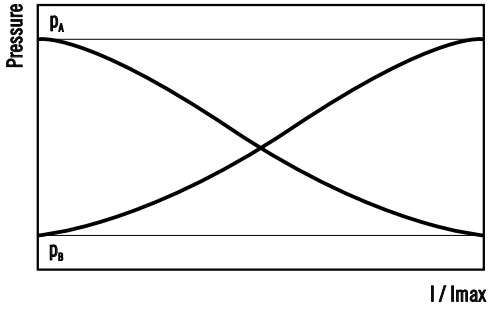
ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PEC

Regulates the pump displacement automatically to mantain the pressure below the variable limit set through a command current signal.

OPERATING CURVES

Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

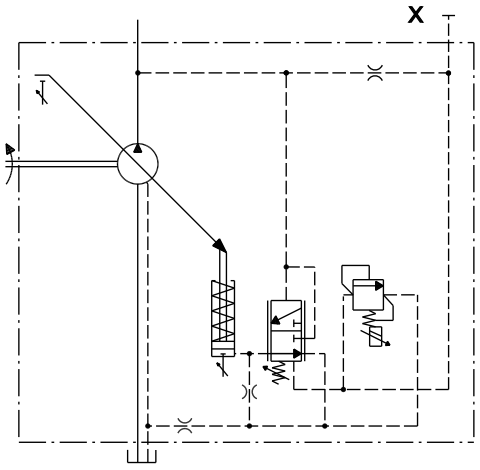


VALVE FEATURES

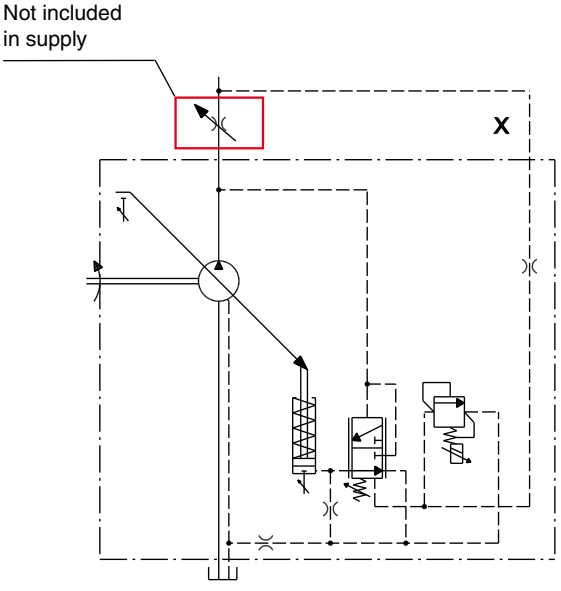
Valve type	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
6	Normally open	12 VDC
7	Normally open	24 VDC

Volt	12 V (+/- 10%)	24 V (+/- 10%)
Control current	50 ÷ 1200 mA	50 ÷ 600 mA
Limit current	1,25 A	0,63 A
Dither frequency	150 Hz	150 Hz
Operating temperature	-40 °C ÷ 100 °C (-40 °F ÷ 212 °F)	
P_B Pressure range	25 ÷ 100 bar (363 ÷ 1450 psi)	
P_A Pressure range	210 ÷ 310 (3045 ÷ 4495 psi)	
Connector type	DIN 43 650 / ISO 4400 or DEUTSCH	

PEC



PEC - LS2 (with flow control)



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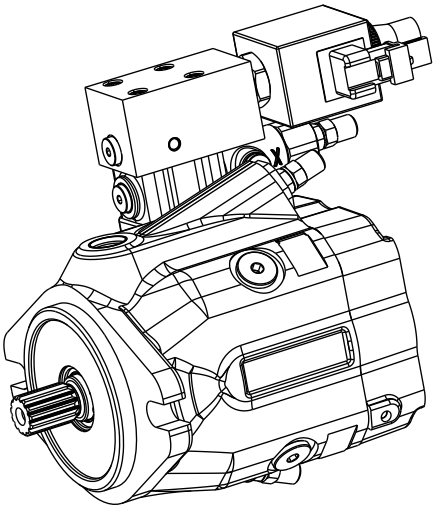

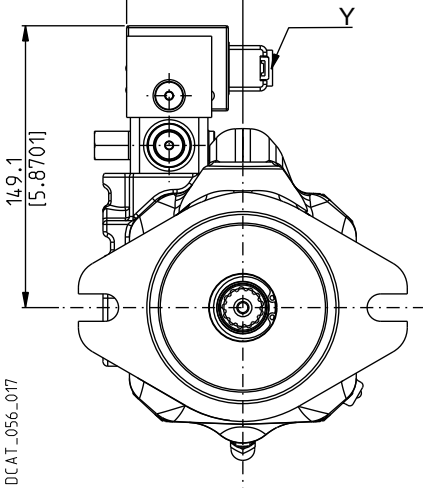

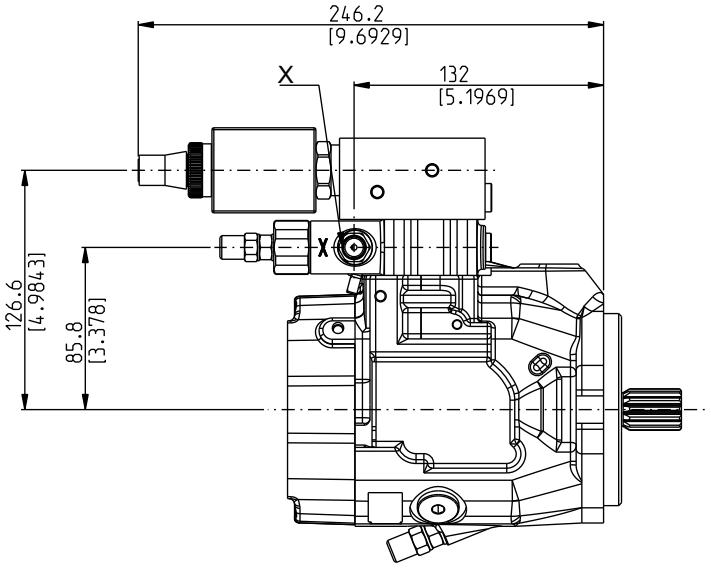

X: Load-sensing port. Dimensions at page 10 ÷ 11
Y: Connector type DIN 43 650 / ISO 4400 or DEUTSCH.

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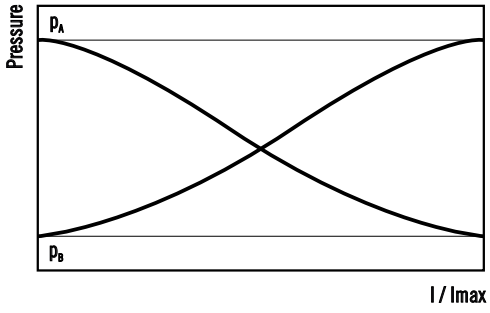
ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PLUS ANGULAR SENSOR PECA

Regulates the pump displacement automatically to mantain the pressure below the variable limit set through a command current signal. The swivel angular sensor converts the actual position of the swashplate into a voltage output signal that can be used for different purposes. This signal and the proportional relief valve allow to realise the following different control logics by means of an external control unit:

- Variable maximum pressure limiter
- Electronic flow compensator with variable setting (variable Load-Sensing)
- Electronic torque limiter with variable torque setting
- Power limiter
- Flow control
- Working e-modes

OPERATING CURVES

Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

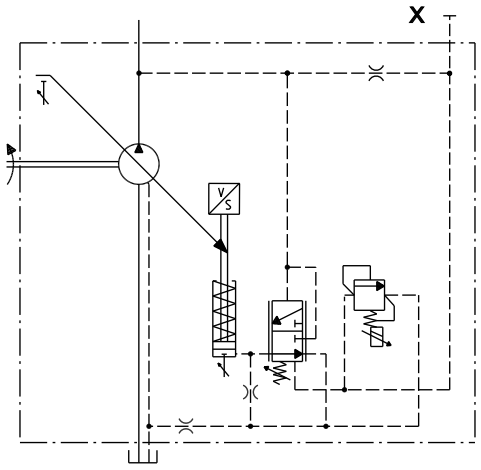


VALVE FEATURES

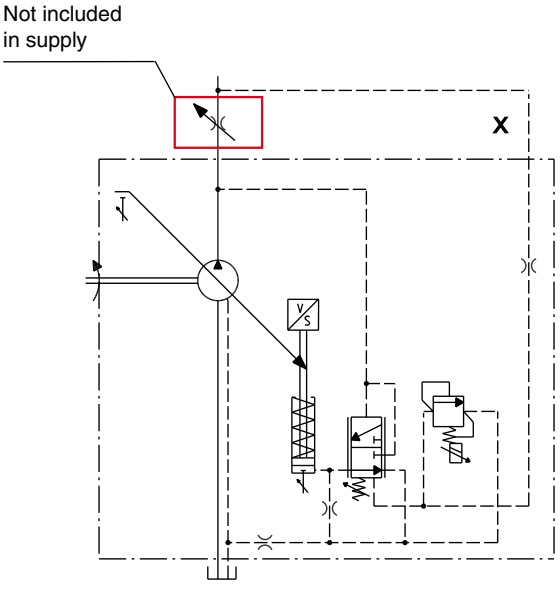
Valve type	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
6	Normally open	12 VDC
7	Normally open	24 VDC

Volt	12 V (+/- 10%)	24 V (+/- 10%)
Control current	50 ÷ 1200 mA	50 ÷ 600 mA
Limit current	1,25 A	0,63 A
Dither frequency	150 Hz	150 Hz
Operating temperature	-40 °C ÷ 100 °C (-40 °F ÷ 212 °F)	
P_B Pressure range	25 ÷ 100 bar (363 ÷ 1450 psi)	
P_A Pressure range	210 ÷ 310 (3045 ÷ 4495 psi)	
Connector type	DIN 43 650 / ISO 4400 or DEUTSCH	

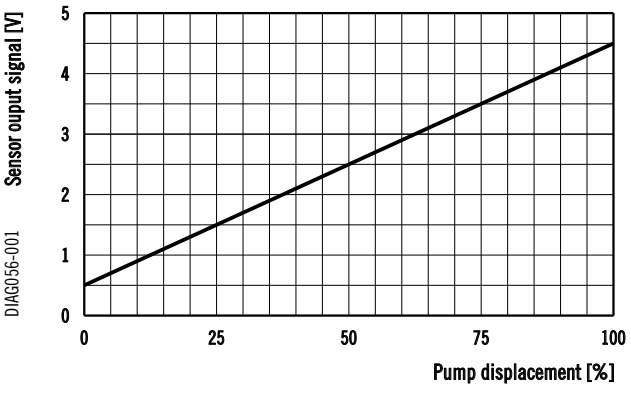
PECA



PEC - LS2 (with flow control)



ANGULAR SENSOR



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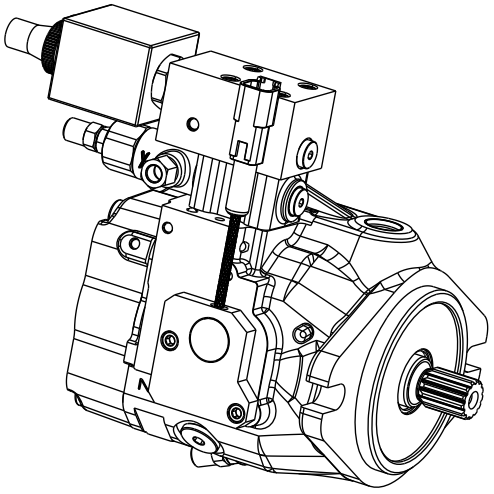
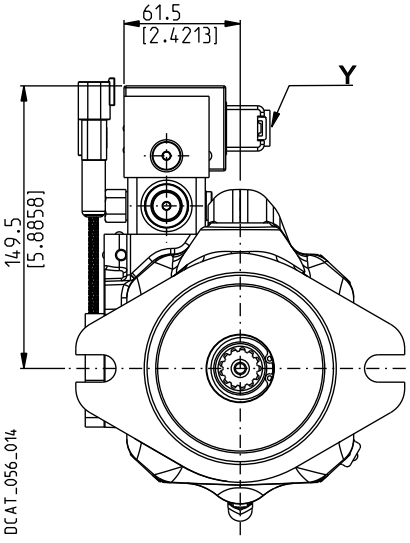
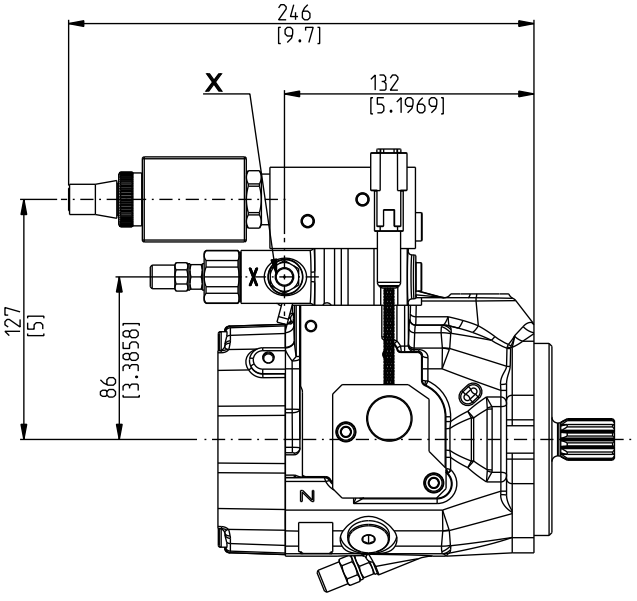
ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PLUS ANGULAR SENSOR PECA







X: Load-sensing port. Dimensions at page 10 ÷ 11
Y: Connector type DIN 43 650 / ISO 4400 or DEUTSCH.

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FLOW COMPENSATOR (Load-sensing) LS

Regulates the pump displacement to maintain a constant (load independent) pressure drop across a flow metering device. In the standard version the flow compensator is combined with pressure compensator.

Flow compensator type	Pressure compensator	Differential pressure setting range	Standard setting
		bar (psi)	bar (psi)
LS0 (■)	**RPO**	10 ÷ 40 (145 ÷ 580)	14 (203)
LS2 (◆)	**RPO**		
LS3 (●)	**RPO**		

(■): Suggested when the directional control valve does not have the bleed function

(◆): Y is plugged. Suggested when the directional control valve has the bleed function

(●): For remote pressure control.

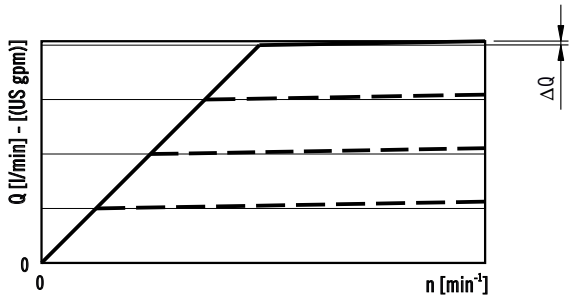
Pilot flow ≈ 1,3 ÷ 1,5 l/min (0.34 ÷ 0.40 US gpm)

In standard setting conditions 14 bar (203 psi) the stand-by pressure is $15^{\pm 2}$ bar ($218^{\pm 29}$ psi).

OPERATING CURVES

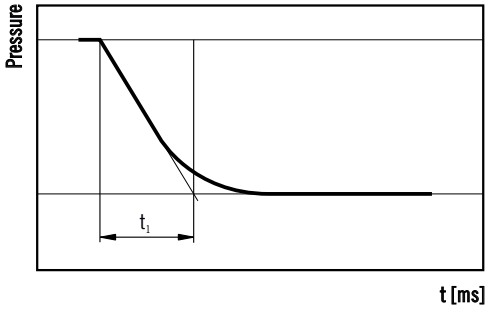
Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

Curve at variable speed

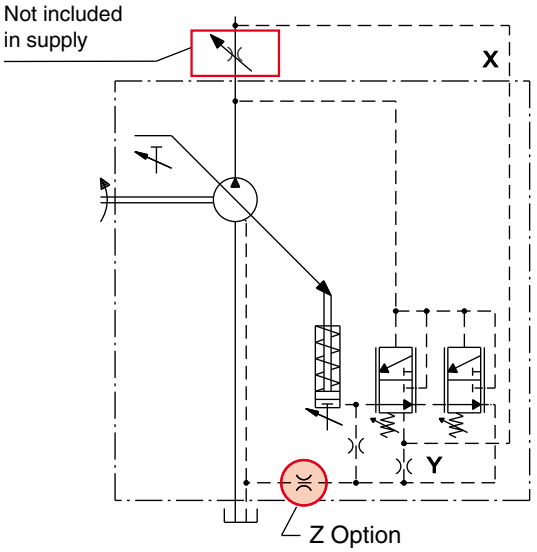


RESPONSE TIME

According to SAE J745 (using outlet pressure).

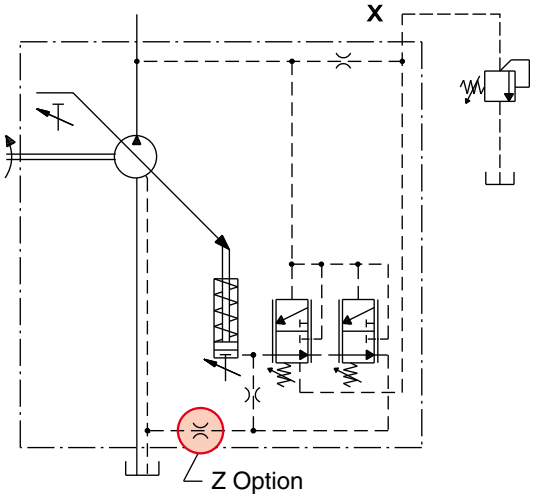


LS0 - LS2



(See page 16 for more information)

LS3 - Remote pressure compensator



(See page 16 for more information)

	ΔQ max
Pump type	l/min (US gpm)
MVPD30	0,9 (0.24)

	t_1
Pump type	Response time [ms] (off stroke)
MVPD30	120

According to SAE J745 (using outlet pressure)

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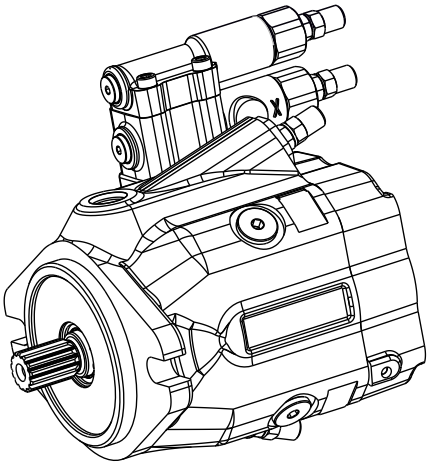
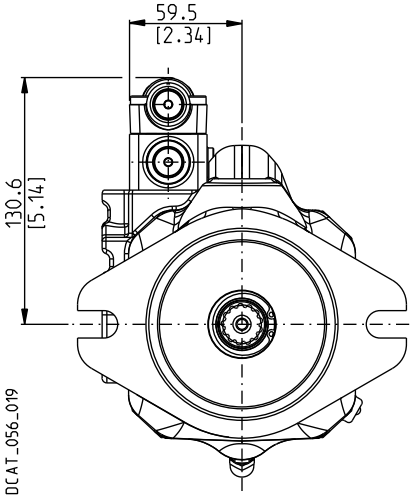
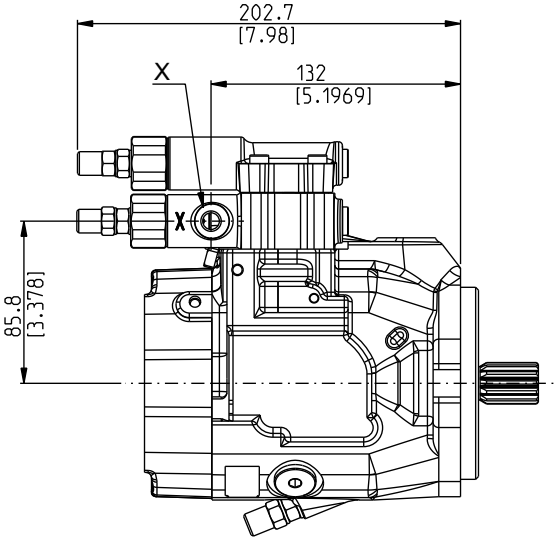
FLOW COMPENSATOR (Load-sensing) LS







X: Load-sensing port. Dimensions at page 10 ÷ 11

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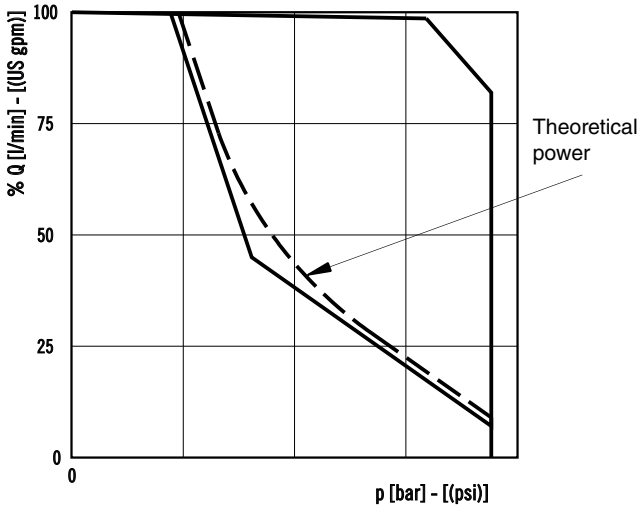
TORQUE LIMITER RN

Regulates the pump displacement according to the system pressure, to maintain the pre-adjusted torque value and protect the prime mover from overload.

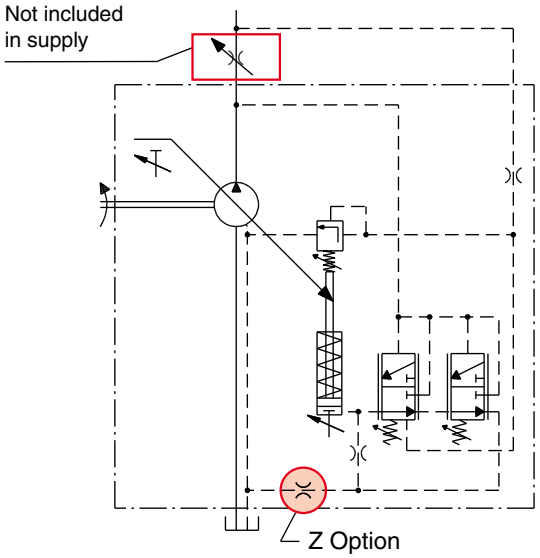
When ordering the torque limiter please specify the requested value of torque [eg. 70 Nm (620 lbf in)] or the requested power and speed [eg. 10 kW (13.4 HP) at 1500 min^{-1}].

OPERATING CURVES



RN0 - Standard

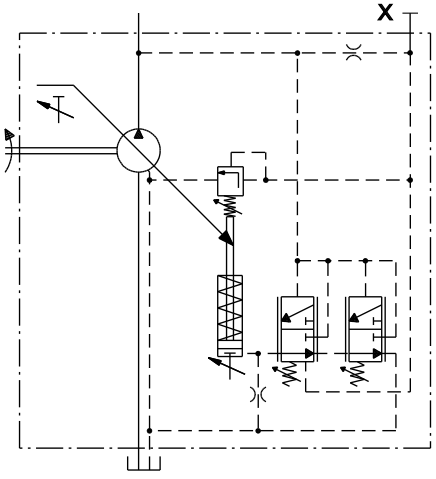
Torque limitation for closed center valve.



(See page 16 for more information)

RN1 - Internal pilot

Torque limitation for open center valve.



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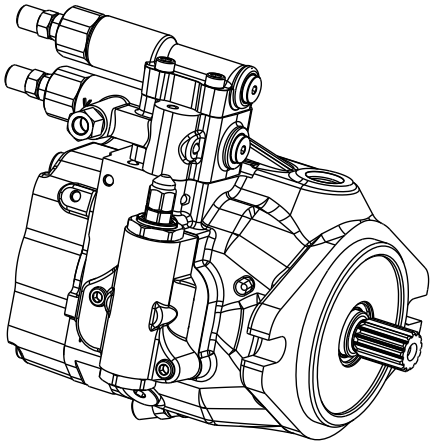
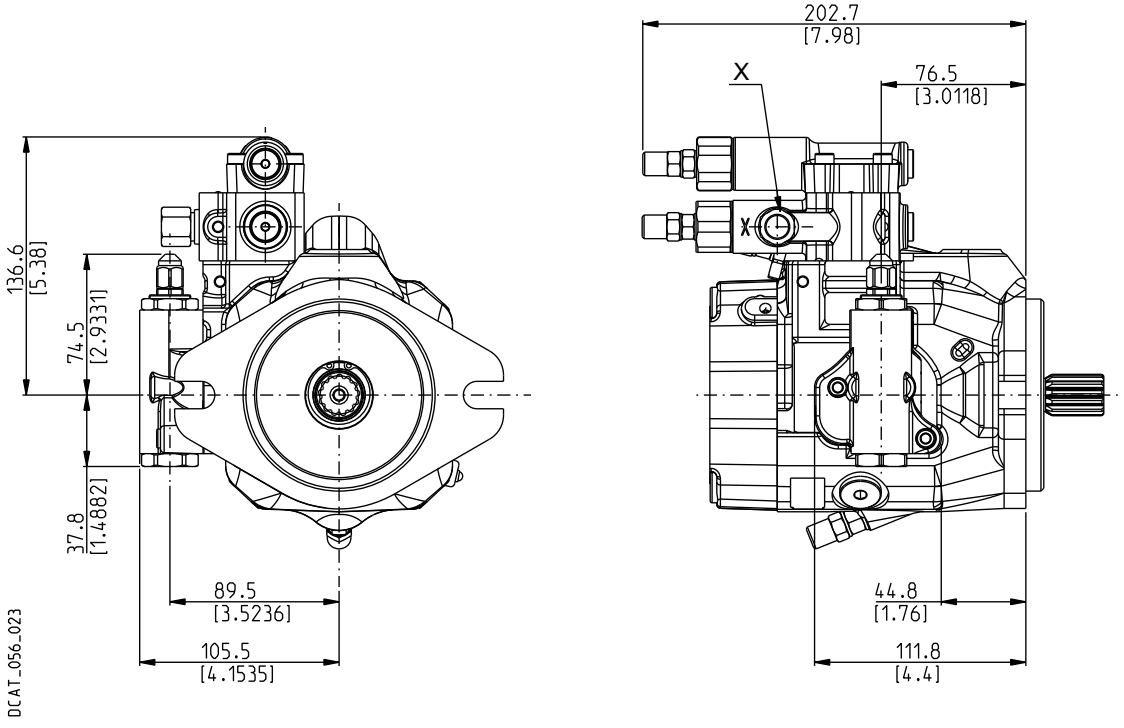
TORQUE LIMITER RN





X: Load-sensing port. Dimensions at page 10 ÷ 11

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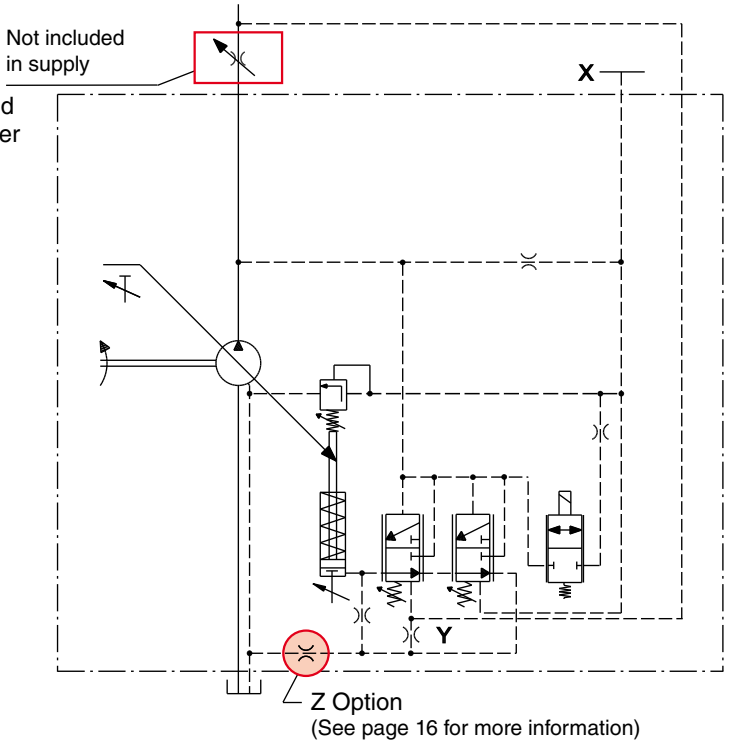
DUAL SETTING TORQUE LIMITER RN2

Regulates the pump displacement automatically to mantain the torque below two fixed pre-adjusted limits.
The electrically piloted valve allows to switch between the two different limits.

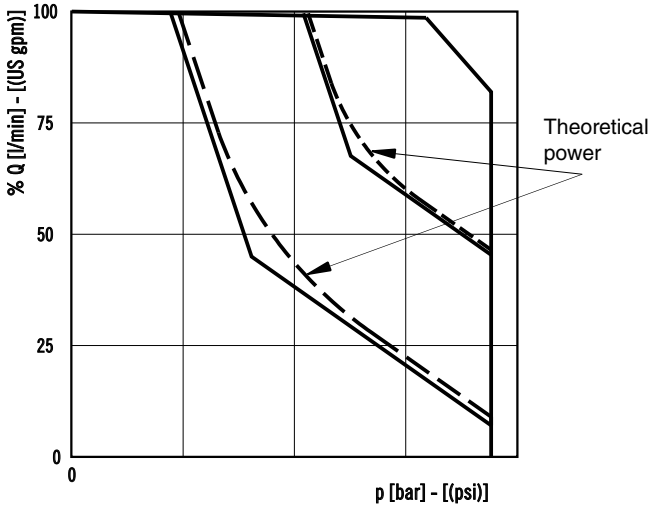
When ordering the torque limiter please specify the requested value of torque [eg. 70 Nm (620 lbf in)] or the requested power and speed [eg. 10 kW (13.4 HP) at 1500 min^{-1}].

RN2-LS0 / RN2-LS2

For LS2 configuration Y is plugged.



OPERATING CURVES



VALVE FEATURES

Volve type	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
6	Normally open	12 VDC
7	Normally open	24 VDC

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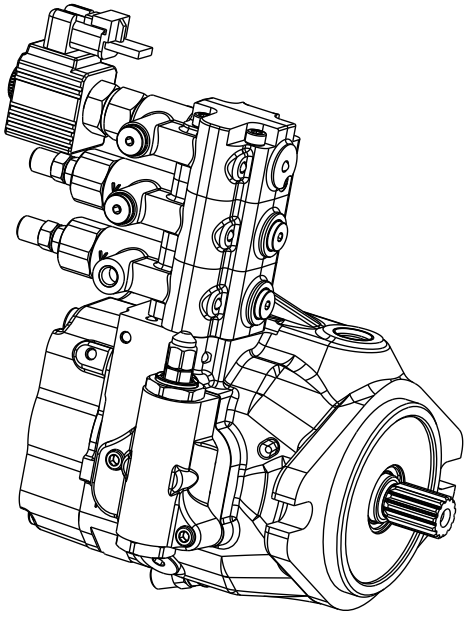
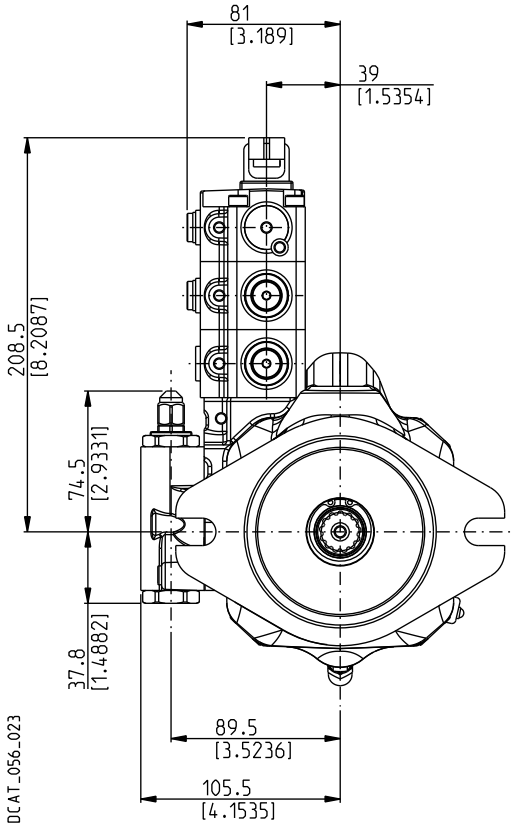
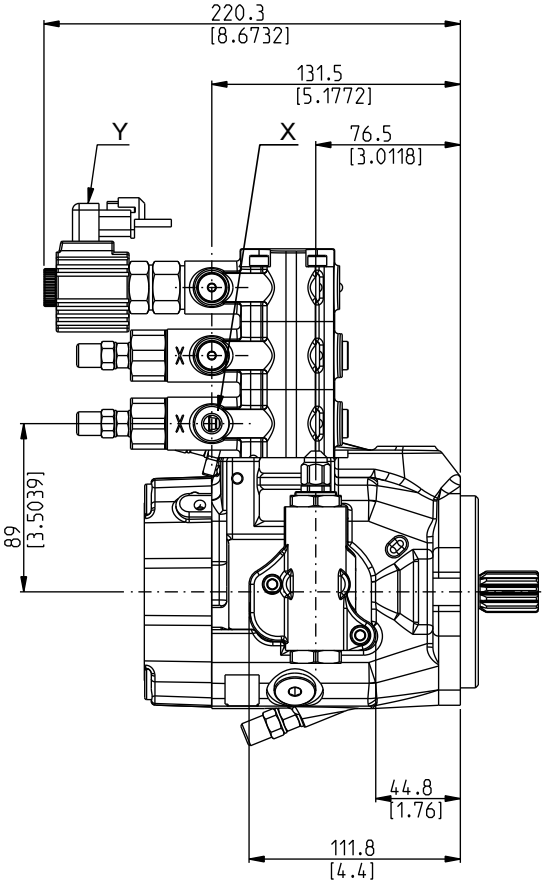
DUAL SETTING TORQUE LIMITER RN2







X: Load-sensing port. Dimensions at page 10 ÷ 11
Y: Connector. Standard type DIN 43 650 / ISO 4400.
For other connectors please consult our technical sales department.

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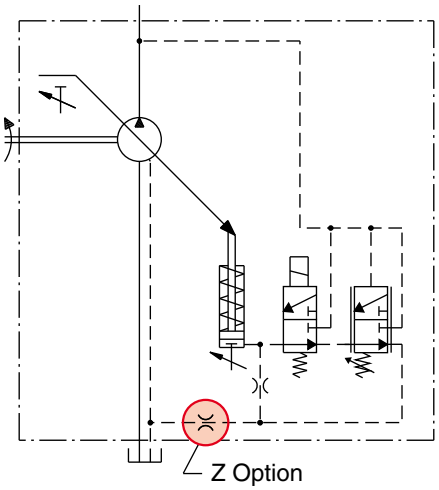
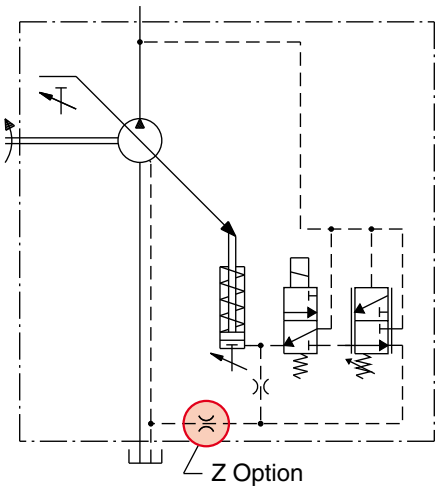
UNLOADING VALVE U ..

NC (normally closed)



With the valve NC type (normally closed), energizing the solenoid valve the displacement is reset and the pump is unloaded.

NA (normally open)



With the valve NA type (normally open), energizing the solenoid valve the pump works at the maximum displacement.

NOTES

Unloading valve can be supplied only with pressure compensator RP.

VALVE FEATURES

Valve type	Arrangement	Volt
U1	Normally closed	12 VDC
U2	Normally closed	24 VDC
U3	Normally closed	24 VAC
U4	Normally closed	110 VAC
U5	Normally closed	220 VAC
U6	Normally open	12 VDC
U7	Normally open	24 VDC
U8	Normally open	24 VAC
U9	Normally open	110 VAC
U10	Normally open	220 VAC

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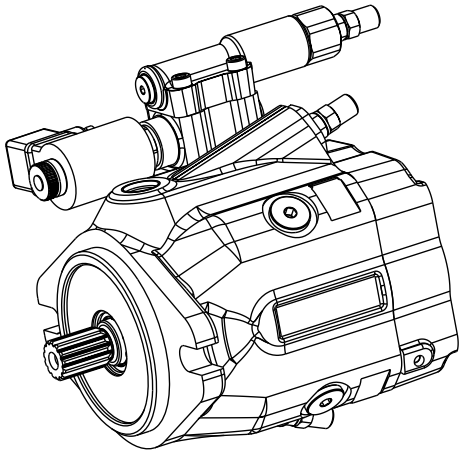
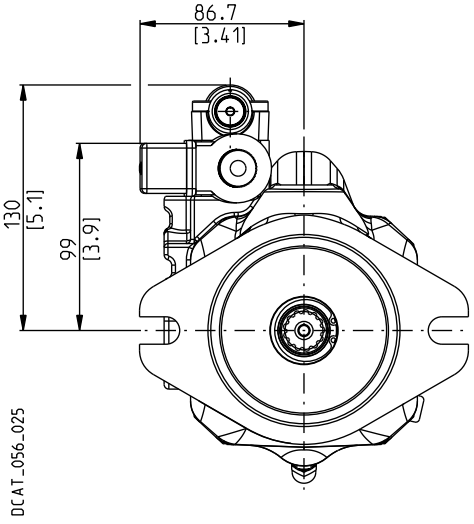
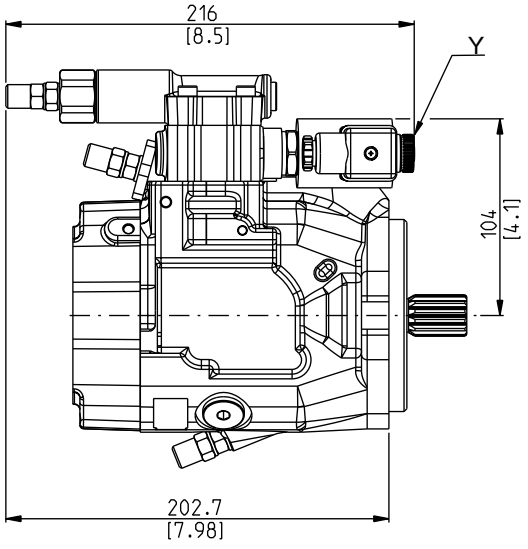
UNLOADING VALVE

U ..







Y: Connector. Standard type DIN 43 650 / ISO 4400.
For other connectors please consult our technical sales department.

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HOW TO ORDER SINGLE PUMPS

1	2		3	4		5	6		7		8 ...
MVPD30·45	S	-	04	S5	-	L	ME/MB	-	N	-	...

1 Pump type (max. displacement)	Code
34 cm³/rev (2.07 in³/rev)	MVPD30·34
45 cm³/rev (2.75 in³/rev)	MVPD30·45

2 Rotation	Code
Anti-clockwise	S
Clockwise	D

3 Drive shaft (a)	Code
SAE “B” spline (13 teeth)	04
SAE “B” spline (13 teeth)	4R
SAE “B” straight	32

4 Mounting flange (a)	Code
SAE “B” 2 holes	S5

5 Ports position	Code
Side	L
Rear	P

Code	6 Inlet/outlet ports		
	Nominal size		Pump type
	Inlet IN	Outlet OUT	
	SAE 3000	SAE 3000	
SAE FLANGED PORTS METRIC THREAD (SSM)			
ME/MB	1” 1/2	3/4”	MVPD30
SAE FLANGED PORTS UNC THREAD (SSS)			
SE/SB	1” 1/2	3/4”	MVPD30
SAE STRAIGHT THREAD PORTS (ODT)			
	—	—	MVPD30

Code	7 Seals
N	Buna (standard)
V	Viton

Code	8 Regulators
...	See how to order on page 31 ÷ 33

(a) Drive shafts/mounting flanges availability on page 9

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HOW TO ORDER REGULATORS

PRESSURE COMPENSATORS - FLOW COMPENSATORS (Load-sensing)

	8		9		10		11		12		13
Pressure compensator	RP0	-									G
Pressure compensator	RP1	-									G
Pressure compensator with flow control	RP1	-			LS2	-					G
Dual setting pressure compensator	RP2	-	1	-					S	-	G
Dual setting pressure compensator with flow control	RP2	-	1	-	LS2	-	Z	-	S	-	G
Flow compensator	LS0	-					Z	-			G
Flow compensator for remote control	LS2	-					Z	-			G
Pressure compensator for remote control	LS3	-					Z	-			G

8	Regulators type	Code
Pressure compensator		RP0
Pressure compensator		RP1
Dual setting pressure compensator		RP2
Flow compensator		LS0
Flow compensator for remote control		LS2
Pressure compensator for remote control		LS3

9	Valve type (a)	Code
Normally closed 12 VDC		1
Normally closed 24 VDC		2
Normally closed 24 VAC		3
Normally open 12 VDC		6
Normally open 24 VDC		7
Normally open 24 VAC		8

Code	Flow control option (b)	10
LS2	Flow compensator	

Code	Restrictor option (c)	11
	Without restrictor (standard - no code)	
Z	Damping restrictor (only for critical applications)	

Code	Connector type (a)	12
S	DIN 43 650 / ISO 4400 (standard)	
D	Deutsch	
J	Junior-Timer	

Code	Displacement limiter	13
G	Min. and Max. displacement limiter	

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ORDER EXAMPLE

MVPD30 pump with dual setting pressure compensator:

MVPD30.45S-04S5-LME/MB-N-RP2-1-S-G

(a) Only for RP2

(b) Only for RP1 and RP2

(c) Only for RP2 with flow control, LS0, LS2 and LS3

HOW TO ORDER REGULATORS

TORQUE LIMITERS

	8		9		10		11		12		13		14		15		16
Torque limiter - standard	RN0	-							Z	-	G	-	...	/			...
Torque limiter - internal pilot	RN1	-									G	-	...	/			...
Dual setting torque limiter with flow control	RN2	-	1	-	S	-	LS0	-	Z	-	G	-	...	/	...	/	...
Dual setting torque limiter with remote flow control	RN2	-	1	-	S	-	LS2	-	Z	-	G	-	...	/	...	/	...

8	Regulators type	Code
Torque limiter - standard		RN0
Torque limiter - internal pilot		RN1
Dual setting torque limiter with flow control		RN2

9	Valve type (a)	Code
Normally closed 12 VDC		1
Normally closed 24 VDC		2
Normally open 12 VDC		6
Normally open 24 VDC		7

10	Connector type (a)	Code
DIN 43 650 / ISO 4400 (standard)		S
Deutsch		D
Junior-Timer		J

Code	Flow control option (a)	11
LS0	Flow compensator	
LS2	Flow compensator for remote control	

Code	Restrictor option (b)	12
	Without restrictor (standard - no code)	
Z	Damping restrictor (only for critical applications)	

Code	Displacement limiter	13
G	Min. and Max. displacement limiter	

Code	Torque limiter setting	14
...	Please specify the requested torque value in Nm	

Code	Second torque limiter setting (a)	15
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (c)	16
...	Please specify the requested speed value	

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(a) Only for RN2

(b) Only for RN0 and RN2

(c) Do not exceed the maximum speed shown on page 3

ORDER EXAMPLE

MVPD30 pump with dual setting torque limiter with flow control:

MVPD30.45S-04S5-LME/MB-N-RN2-1-S-LS0-Z-G-150/200/2100

HOW TO ORDER REGULATORS

ELECTRO-PROPORTIONAL PRESSURE COMPENSATORS - UNLOADING VALVES

	8		9		10		11		12		13		14		15		16
Electro-proportional pressure compensator	PEC	-	1	-	A	-					...	/	...	-	S	-	G
Electro-proportional pressure compensator with flow control	PEC	-	1	-	A	-	LS2	-			...	/	...	-	S	-	G
Electro-proportional pressure compensator with flow control	PECA	-	1	-	A	-	LS2	-			...	/	...	-	S	-	G
Unloading valve	U..	-							Z	-							G

8 Regulators type	Code
Electro-proportional pressure compensator	PEC
Electro-proportional pressure compensator and swashplate angular sensor	PECA
Unloading valve - Normally closed 12 VDC	U1
Unloading valve - Normally closed 24 VDC	U2
Unloading valve - Normally closed 24 VAC	U3
Unloading valve - Normally closed 110 VAC	U4
Unloading valve - Normally closed 220 VAC	U5
Unloading valve - Normally open 12 VDC	U6
Unloading valve - Normally open 24 VDC	U7
Unloading valve - Normally open 24 VAC	U8
Unloading valve - Normally open 110 VAC	U9
Unloading valve - Normally open 220 VAC	U10

9 Valve type (a)	Code
Normally closed 12 VDC	1
Normally closed 24 VDC	2
Normally open 12 VDC	6
Normally open 24 VDC	7

10 Position (a)	Code
Position 0°	A
Position 90°	B

Code	Flow control option (b) 11
LS2	Flow compensator for remote control

Code	Restrictor option (c) 12
	Without restrictor (standard - no code)
Z	Damping restrictor (only for critical applications)

Code	Min. pressure setting (a) 13
...	Setting range 25 ÷ 100 bar

Code	Max. pressure setting (a) 14
...	Setting range 210 ÷ 310 bar

Code	Connector type (a) 15
S	DIN 43 650 / ISO 4400 (standard)
D	Deutsch
J	Junior-Timer

Code	Displacement limiter 16
G	Min. and Max. displacement limiter

(a) Only for PEC

(b) Only for PEC with flow control

(c) Only for U.. unloading valve

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ORDER EXAMPLE

MVPD30 pump with electro-proportional pressure compensator with flow control:

MVPD30.45S-04S5-LME/MB-N-PEC-1-A-LS2-100/300-S-G

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

1	2	3	4	5	6	7	8 ...	9	10	11	12
MVPD30·45	S	-	04	S5	-	L	ME/MB	-	N	-	...	-	G	/			

Front section

KP20·6,3			-			-	L	**/GD	-	...	/	...	/	...

Rear section — **Torque limiter setting**

1 Pump type (max. displacement)	Code
Front section - The same of single pumps	MVPD ...
Rear section - KAPPA 20 gear pumps (a)	KP 20 ...
Rear section - POLARIS PH gear pumps (b)	PHP 20 ...

2 Rotation	Code
Anti-clockwise	S
Clockwise	D

3 Drive shaft (c)	Code
SAE "B" spline (13 teeth)	04

4 Mounting flange (c)	Code
SAE "B" 2 holes	S5

5 Ports position	Code
Side	L

Code	Inlet/outlet ports	Nominal size Inlet IN SAE 3000	Nominal size Outlet OUT SAE 3000	Pump type	6
SAE FLANGED PORTS METRIC THREAD (SSM)					
ME/MB		1" 1/2	3/4"	MVPD30	
SAE FLANGED PORTS UNC THREAD (SSS)					
SE/SB		1" 1/2	3/4"	MVPD30	
SAE STRAIGHT THREAD PORTS (ODT)					
**/OC		—	5/8"	KP 20 / PHP 20	
GAS STRAIGHT THREAD PORTS (BSPP)					
**/GD		—	1/2"	KP 20 / PHP 20	

Code	Seals	7
N	Buna (standard)	
V	Viton	

Code	Regulators	8
...	See how to order on page 31 ÷ 33	

Code	Displacement limiter	9
G	Min. and Max. displacement limiter	

Code	Torque limiter setting (d)	10
...	Please specify the requested torque value in Nm	

Code	Second torque limiter setting (d)	11
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (d)	12
...	Please specify the requested speed value	

(a) KAPPA 20 gear pumps:
displacements on page 7. For more information, please see the respective technical catalogue

(b) POLARIS PH gear pumps
displacements on page 8. For more information, please see the respective technical catalogue

(c) Drive shafts/mounting flanges availability on page 9

(d) Only for torque limiter. Refer to page 32 for more information

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Our policy is one of continuous improvement in product. Specification of items may, therefore, be changed without notice.

MVPD 01 T A Edition: 01/10.2013

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