

VARIABLE DISPLACEMENT AXIAL PISTON PUMP

FAMILY CODE

108-050/051

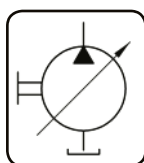
**VDPP 60 VDPP 90
VDPP 110 VDPP 130**



**VDPP 60
VDPP 90
VDPP 110**



VDPP 130

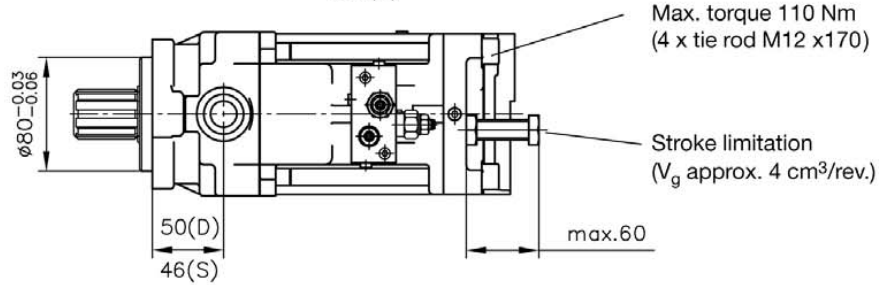
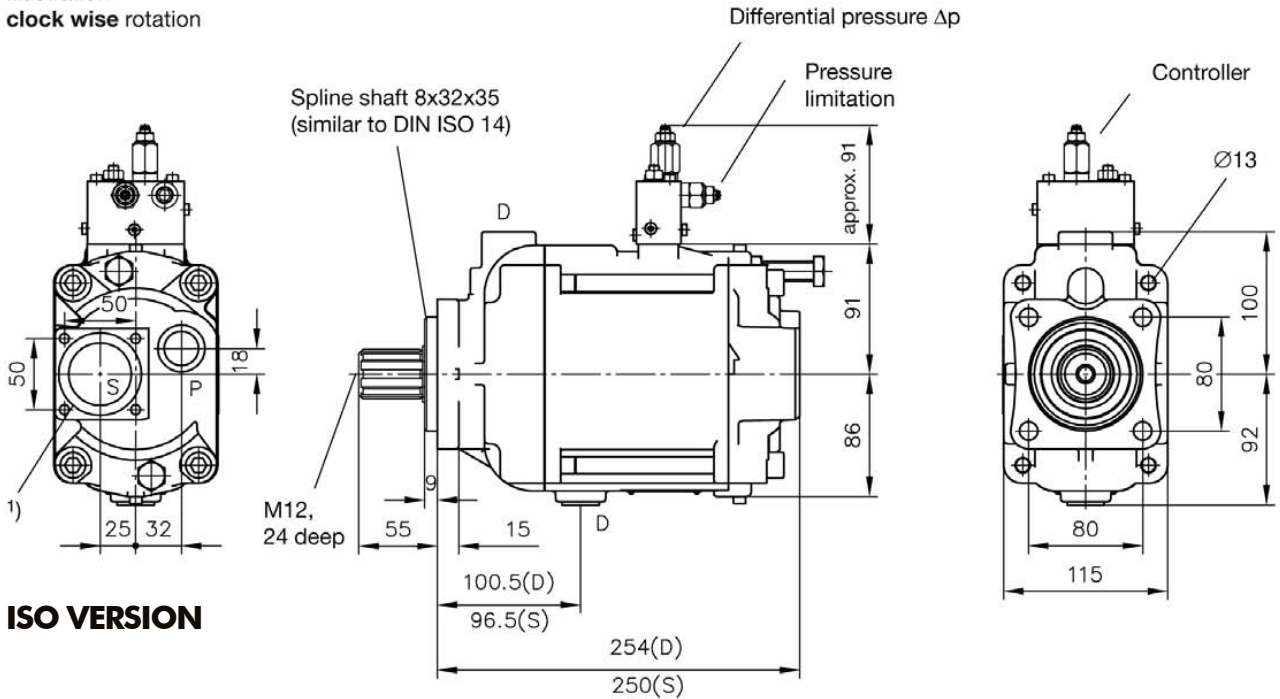


Installed position	preferably horizontal (other positions on request!)
Hydraulic fluid	hydraulic oil to DIN 51524 table 2 and 3; ISO VG 10 to 68 acc. to DIN 51519. Viscosity range: min. approx. 10; max. approx. 1000 mm ² /sec. Optimal operation range: approx. 10...35 mm ² /sec. Also suitable are biologically degradable pressure fluids type HEES (synth. Ester) at operation temperatures up to approx. +70°C.
Temperature	Ambient: approx. -40...+60°C. Fluid: -25...+80°C, pay attention to the viscosity range! Start temperature down to -40°C is allowable (Pay attention to the viscosity range during start!), as long as the operation temperature during subsequent running is at least 20K (Kelvin) higher.
Filtration	Recommended contamination level ≤ 18/13 conforming DIN ISO 4406.
Initial operation	All pipes should be flushed with the same fluid intended for the later service prior to initial operation. The housing of the pump should be primed via the upper case drain port. The case drain line must be routed in such a way the running empty is prevented. The pressure limiting valve should be set to 50 bar or lower for initial operation and the first few minutes of regular service. Attention: do not screw-out the set screw of the sequence/pressure limiting valve beyond the red index marking!

	VDPP 60	VDPP 90	VDPP 110	VDPP 130
Angle of the swash plate	21,5°			
Required inlet pressure abs. for open circuit	0,85 bar			
Max. input pressure	2 bar			
Max. body pressure	3 bar			
Max. permissible drive torque	430 Nm	530 Nm	600 Nm	700 Nm
Max. rev. rating when self priming and max. angle of the swash plate at 1 bar abs. inlet pressure.	2500 rpm	2300 rpm	2200 rpm	2100 giri/min
Min. rev. rating for permanent running	500 rpm			
Required torque at 100 bar	100 Nm	151 Nm	184 Nm	230 Nm
Drive power for 250 bar and 2000 rpm	53 kW	79.5 kW	97,2 kW	120 kW
Weight torque	30 Nm	35.3 Nm	40 Nm	40 Nm
Inertia moment	0,005 kg m ²	0,008 kg m ²	0,01 kg m ²	0,011 kg m ²
Sound level at 250 bar, 1500 rpm and max. swash plate angle (Measured in a sound measuring room DIN ISO 4412, distance 1m)	75 dB(A)			
Nomenclature axial piston pump according to the swash plate principle				
Direction of rotation clock wise or counter clock wise				
Changing the rotation direction turn the endplate and change the port plate.				

Pump type	Rotation		Nominal pressure bar	Maximum pressure bar	Displacement cm ³ /giro	Weight kg
	Right	Left				
VDPP 60 ISO	108-050-00609	108-050-00618	350	400	60	22
VDPP 60 SAE	108-051-00608	108-051-00617				
VDPP 90 ISO	108-050-00903	108-050-00912			90	25.8
VDPP 90 SAE	108-051-00902	108-050-00911				
VDPP 110 ISO	108-050-01108	108-050-01117			110	28
VDPP 110 SAE	108-051-01107	108-051-01116				
VDPP 130 ISO	108-050-01304	108-050-01313	400	450	130	32

Illustration
clock wise rotation



- 1) Mounting kit is scope of delivery
- 4x skt.-head screw M8x16-8.8
 - O-ring 44.2x3 NBR 70 Sh
 - 2 brackets

Ports (DIN ISO 228/1 (BSPP):

- P = Pressure outlet G 3/4
- S = Flange, suction port
- D = Case drain G 3/4

Coding **UNF** ports conforming SAE J 514:

- P = 1 5/16-12 UN-2B
- S = Flange, suction port
- D = 1 1/16-12 UN-2B
- LS = G 1/4 (DIN ISO 228/1 (BSPP)) with adaptor for 7/16-20 (SAE-4)

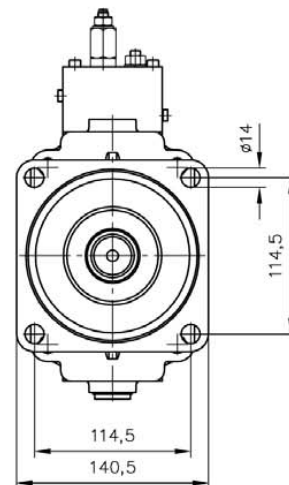
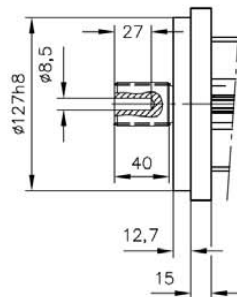
Codice fascicolo: 997-400-10850

Data: Lunedì 25 maggio 2015

Codice foglio: 997-108-50065 Rev: AB

SAE VERSION

Spline shaft SAE-C
14T-12/24 DP



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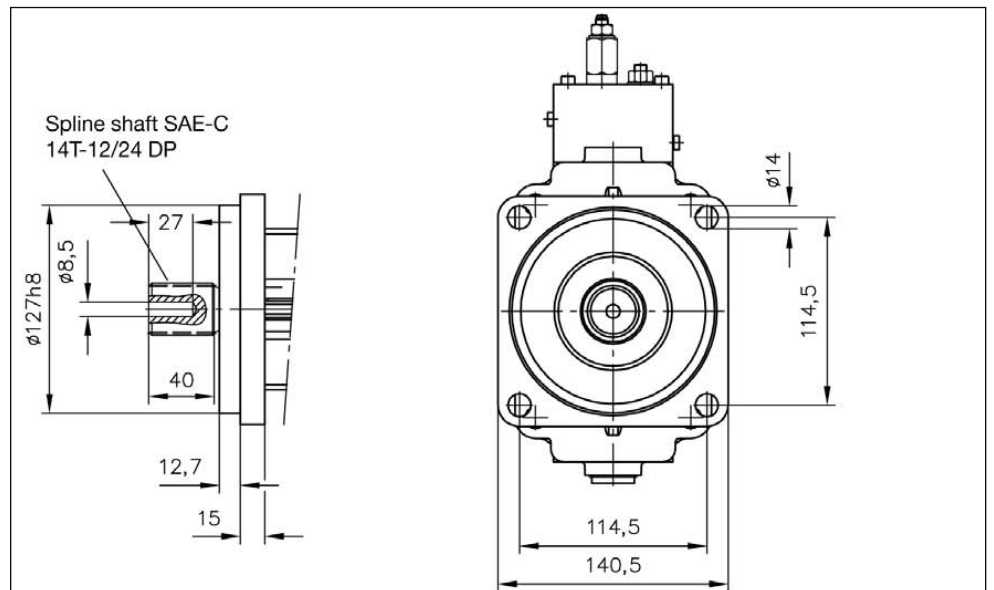
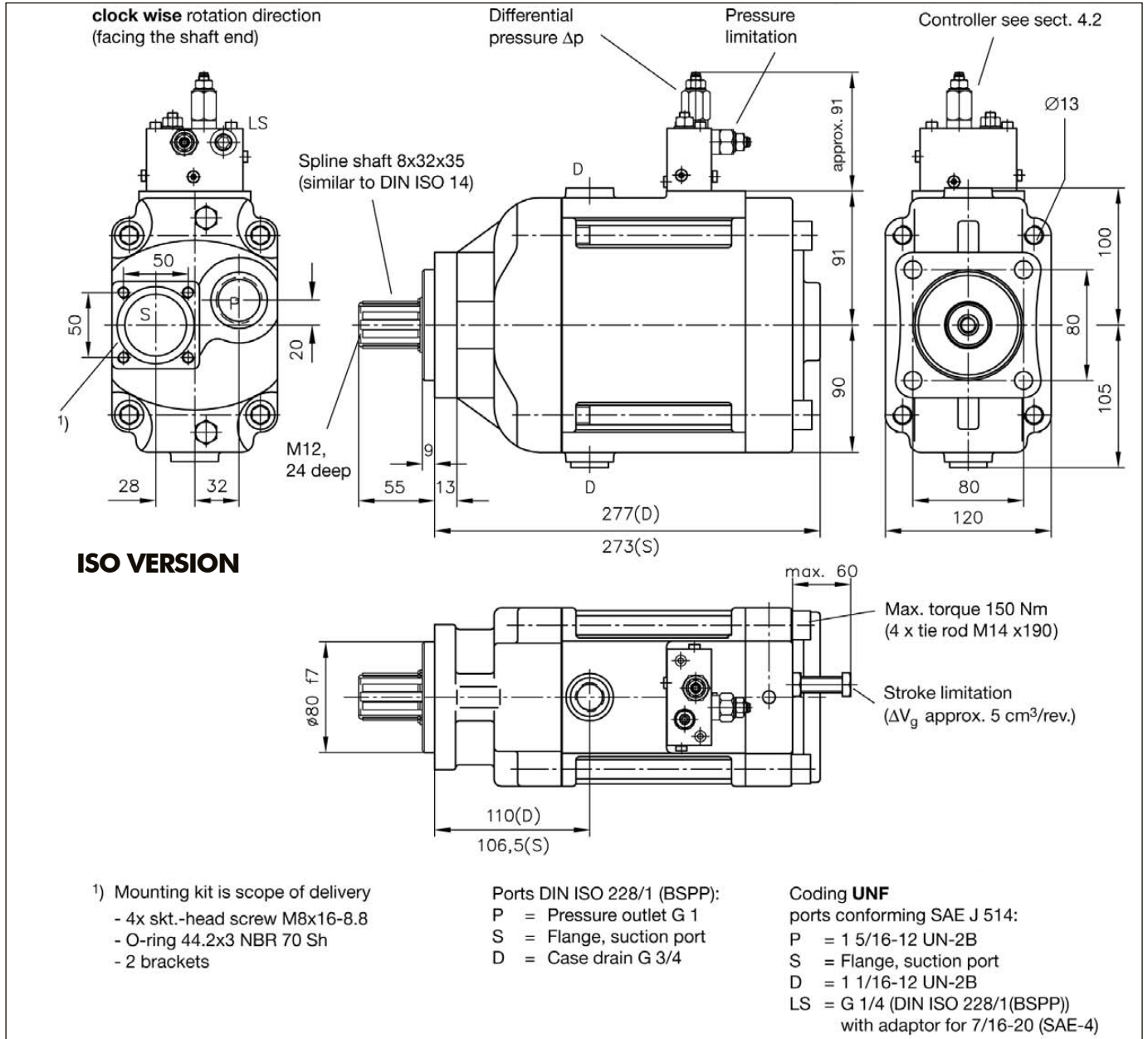
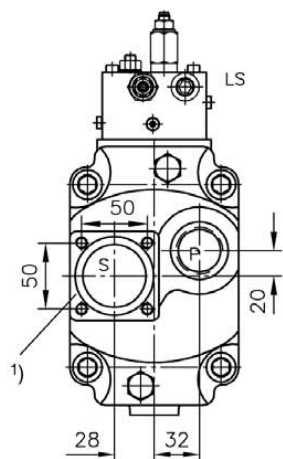
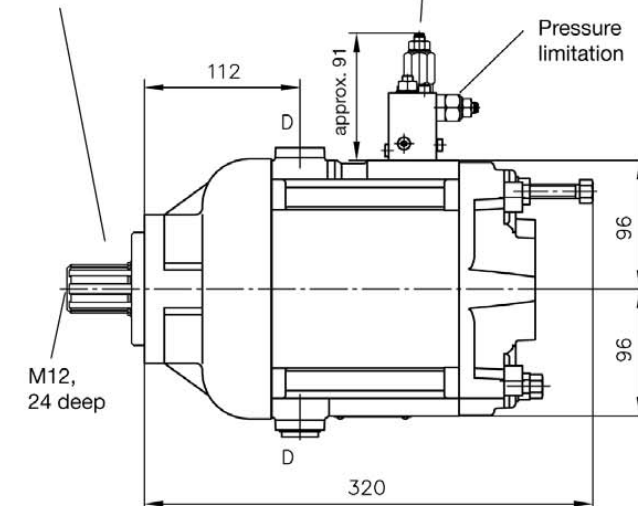


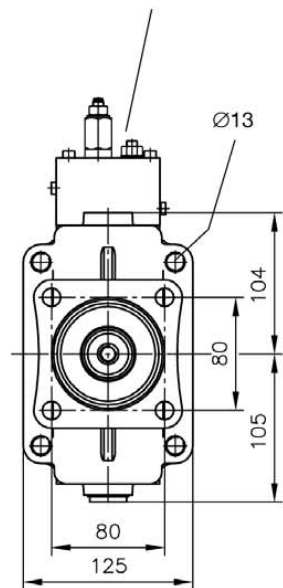
Illustration
clock wise rotation
direction
(facing the shaft end)



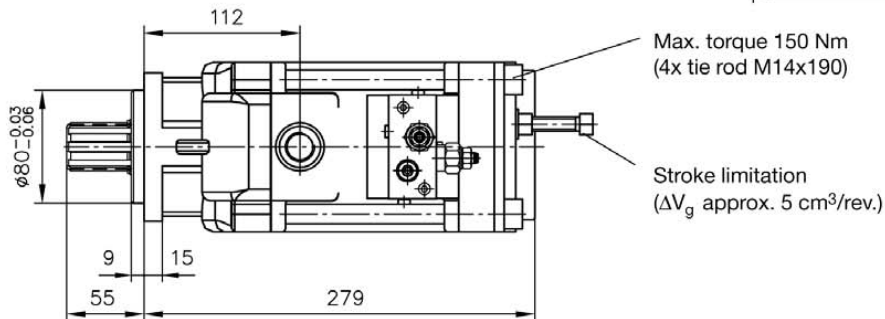
Spline shaft 8x32x35
(similar to DIN ISO 14)



Controller see sect. 4.2



ISO VERSION



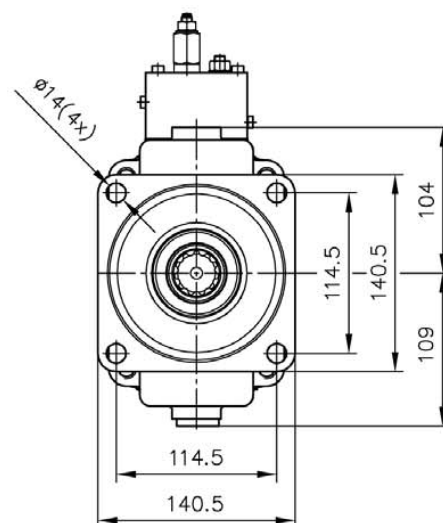
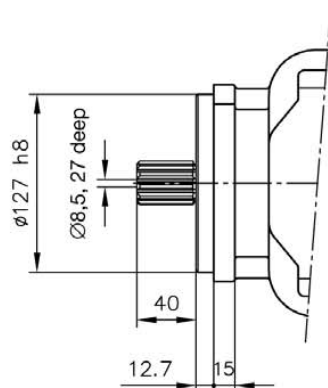
- 1) Mounting kit is scope of delivery
- 4x skt.-head screw M8x16-8.8
- O-ring 44.2x3 NBR 70 Sh
- 2 brackets

- Ports DIN ISO 228/1 (BSPP):
P = Pressure outlet G 1
S = Flange, suction port
D = Case drain G 3/4

- Coding **UNF**
ports conforming SAE J 514:
P = 1 5/16-12 UN-2B
S = Flange, suction port
D = 1 1/16-12 UN-2B
LS = G 1/4 (DIN ISO 228/1(BSPP))
with adaptor for 7/16-20 (SAE-4)

SAE VERSION

Spline shaft SAE-C14T-12/24 DP

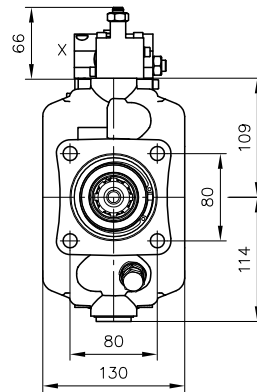
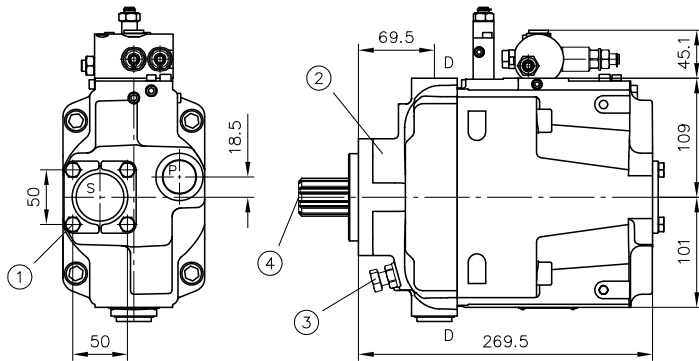


Codice fascicolo: 997-400-10850

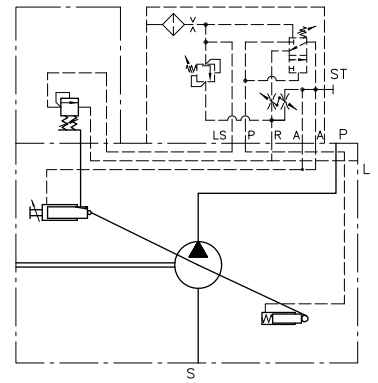
Data: Lunedì 25 maggio 2015

Codice foglio: 997-108-50065 Rev: AB

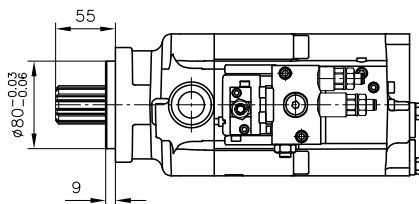
Flange version (input side)
Rotation direction: clockwise
(when looking at the shaft journal)
Coding Y
ISO 7653-1985



Tipo V60N-130



VERSIONE ISO



1. Delivery includes attachment kit for suction intakes according to Section 7.2.
2. Flange version (input side)
3. Stroke limitation (13 cm \bar{U} rev.)
4. Parallel key splined shaft coding D (DIN ISO 14)

Delivery includes attachment kit for suction intakes, comprising:

- 4x hex bolt M8x16-8.8
- O-ring 44.2x3 NBR 70 Sh
- 2 mounting flange halves

Connections P, S and D (ISO 228/1)

P =	pressure port G 1
S =	flange suction port
D =	drain port G 3/4
X =	G 1/4

for coding UNF, ports SAE J 514

P =	pressure port 1 5/16-12 UN-2B
S =	flange suction port
D =	drain port 1 1/16-12 UN-2B
X =	G 1/4 (ISO 228/1) with adapter for 7/16-20 (SAE-4)

Delivery flow and power

The diagrams illustrate delivery flow/pressure (without controller).
Drive power at max. swash plate angle and drive power at zero stroke and 1500 rpm.

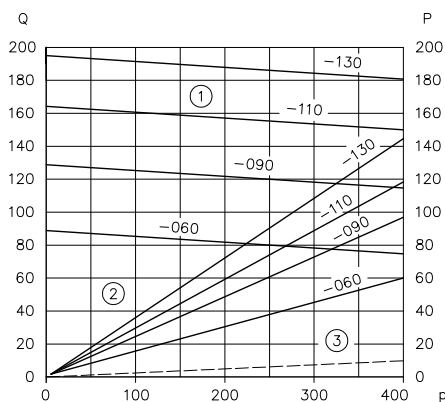


Image 6: p pressure (bar); Q delivery flow (l/min)

1. Delivery flow
2. Power
3. Power (zero stroke)

Inlet pressure and self-suction speed

The curves apply for viscosity of 75 mm²/s at max. swash plate angle

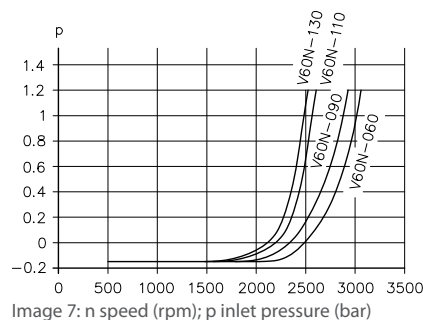
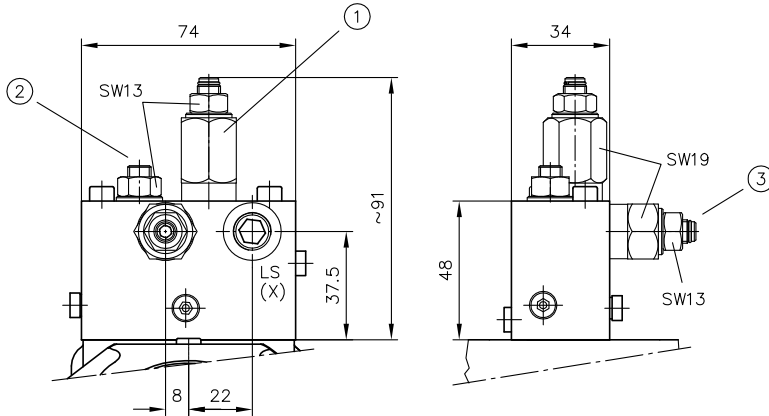


Image 7: n speed (rpm); p inlet pressure (bar)

VDPP PUMP CURVES

TYPE	DESCRIPTION
LSN	Load-Sensing controller with integrated pressure limitation
N	Pressure controller, adjustable directly at the pump. The Pressure controller automatically maintains a constant system pressure independant of the required flow. Therefore it is suited for constant pressure systems, where differing flow is required or as efficient pressure limitation of the hydraulic system.
LLSN	Power controller (torque limitation) in combination with LSN Product "Pressure x Displacement" = constant Adjustment range: 25...100% of max. drive torque
LN	Power controller (torque limitation) in combination with pressure controller N Adjustment range: 25...100% of max. drive torque

Type LSN, LN, N and LLSN

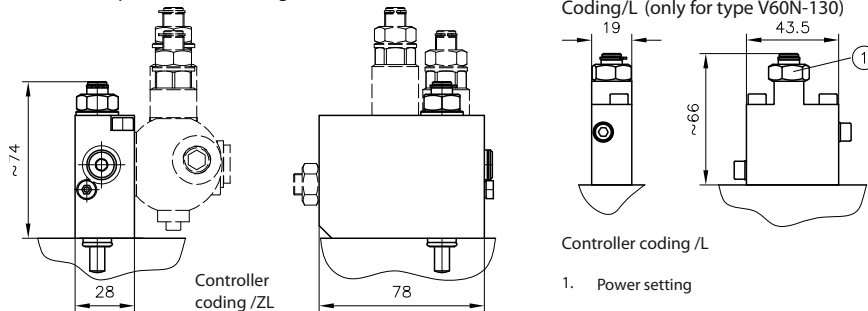


LS signal port
Port (ISO 228/1):
LS = G 1/4

1. Pressure differential Δp (only controller LSN and LLSN)
2. Power setting
3. Pressure limitation

Pressure adjustment	Pressure range (bar)	Δp (bar) /revolution	Default pressure setting (bar)
Pressure limitation	50 ... 400	100	300
Differential pressure Δp (type LSN and LLSN)	18 ... 45	10	27

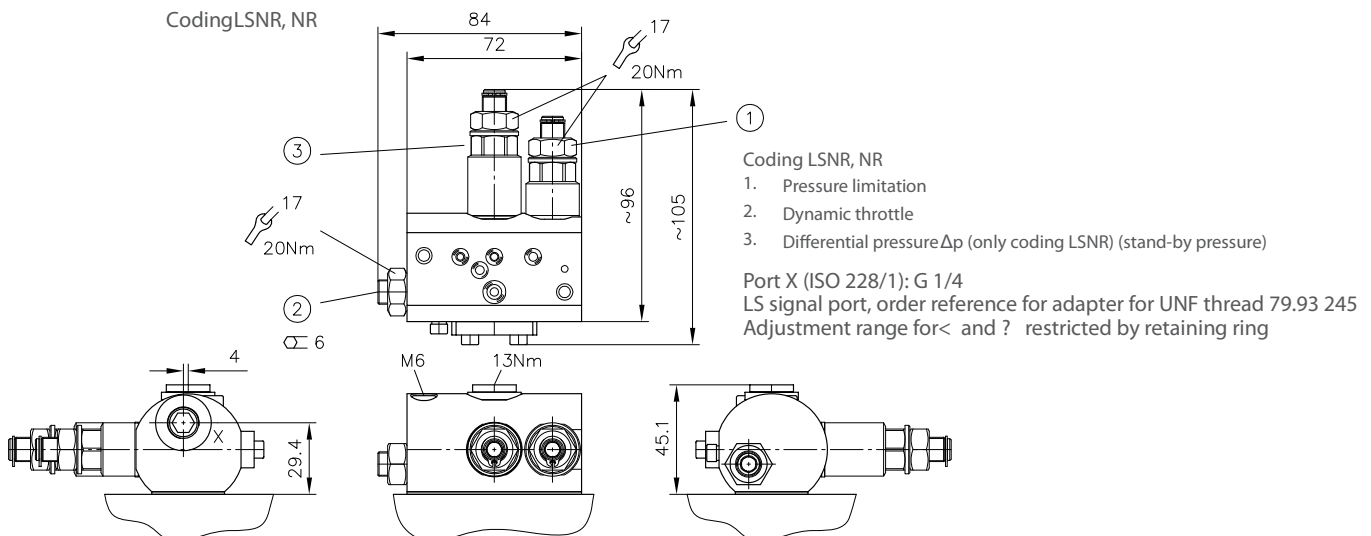
Intermediate plate version, coding/ZL



Pressure adjustment	Pressure range (bar)	Δp (bar) /revolution	Default pressure setting (bar)
Pressure limitation	20 ... 400	approx. 50	300
Differential pressure Δp (only type LSNR)	20 ... 55	approx. 10	27

Caution
Always monitor the pressure gauge when setting or changing the pressure!

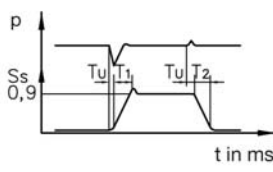
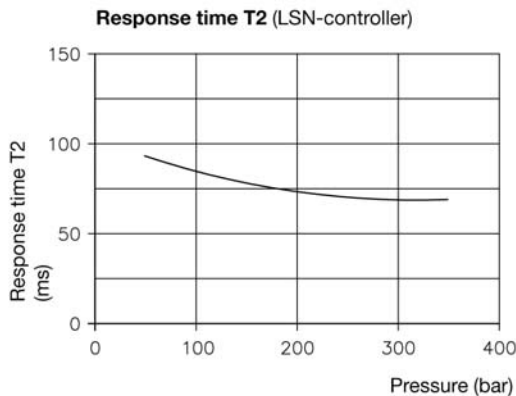
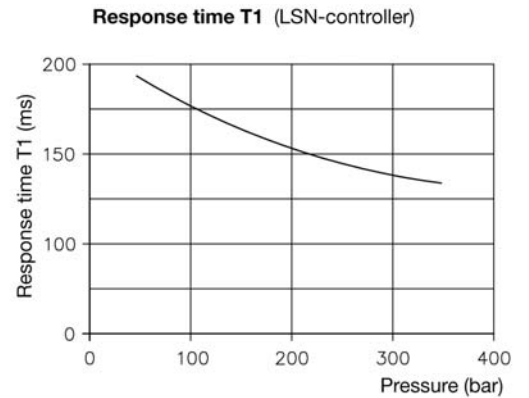
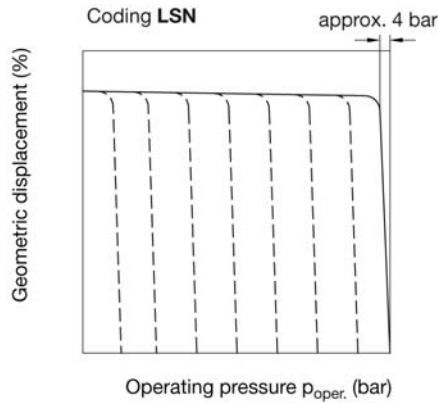
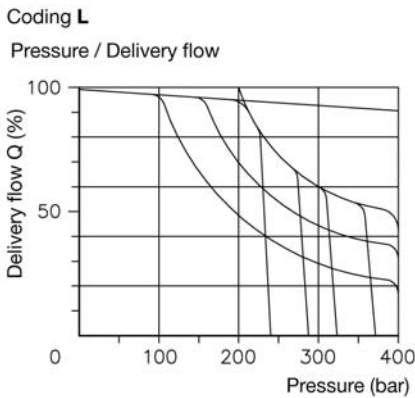
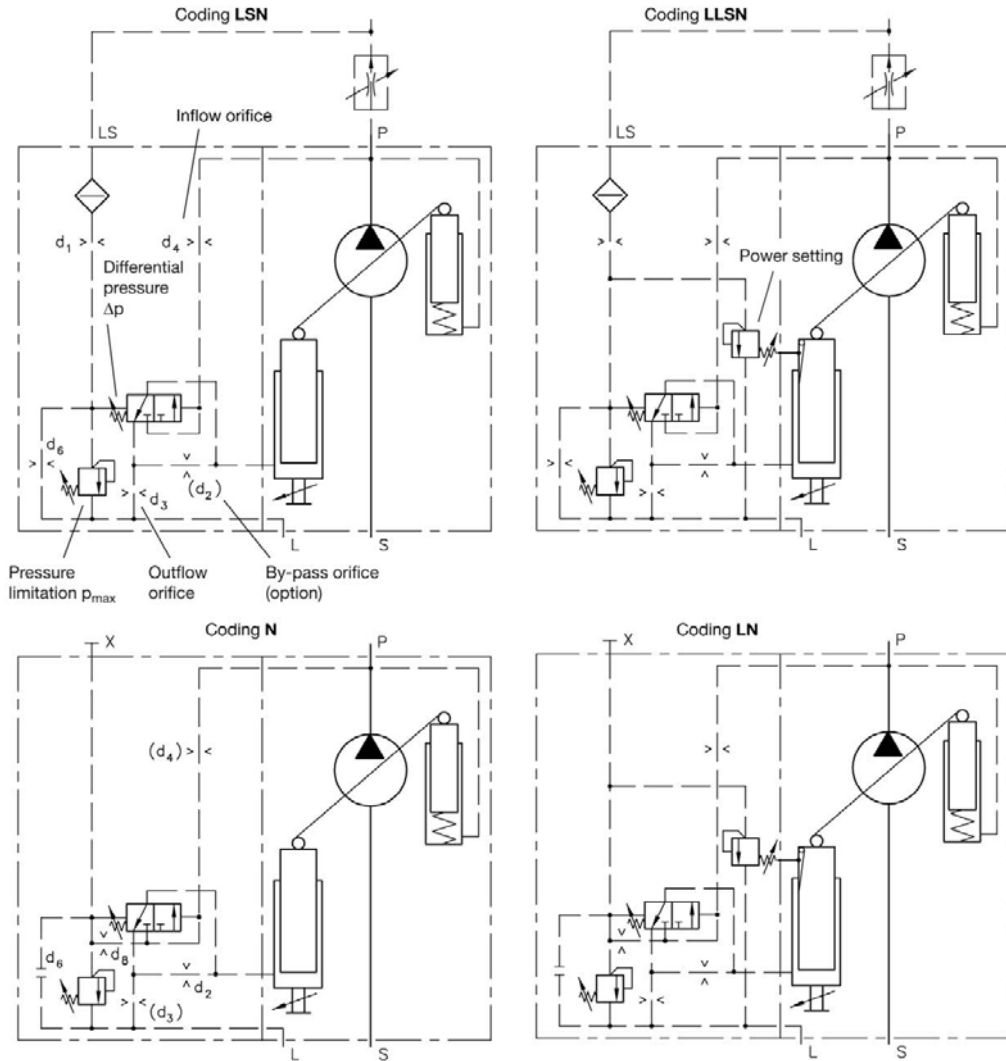
Coding LSNR, NR



Codice fascicolo:997-400-10850

Data: Lunedì 25 maggio 2015

Codice foglio:997-108-50065 Rev:AB



S_s = Displacement
 T_u = Delay < 3 ms
 T_1 = Response time min to max
 T_2 = Response time max to min
 p = Pressure
 LS-line min. length 1.5 m, min. internal diameter 12 mm

CALCULATION:

Flow rate

$$Q = \frac{V_g \cdot n \cdot \eta_v}{1000} \text{ (lpm)}$$

Flow rate

$$M = \frac{1,59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}} \text{ (Nm)}$$

Power

$$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{M \cdot n}{9549} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t} \text{ (kW)}$$

V_g = displacement (cm³/rev)

Δp = differential pressure (bar)

n = speed (rpm)

η_v = volumetric efficiencyη_{mh} = mechanical-hydraulic efficiencyη_t = total efficiency (η_t = η_v x η_{mh})**Special version on demand**

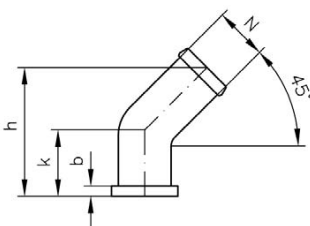
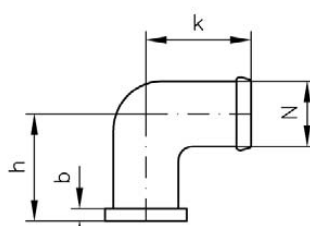
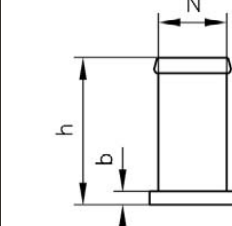
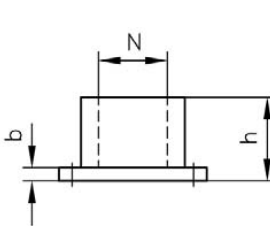
- Variable displacement piston pump with SAE-C flange.
- Variable displacement piston pump - version thru shaft (first pump).
- Variable displacement piston pump - constant power

VDPP 60	RIGHT	LEFT
SEALS	108-950-50600	
DISTRIBUTOR PLATE	108-950-10608	108-950-20606
REGULATOR LSN	108-950-00100	
PRESSURE REGULATOR	108-950-00208	

VDPP 110	RIGHT	LEFT
SEALS	108-950-51092	
SEALS SAE	108-950-51109	
DISTRIBUTOR PLATE	108-950-11107	108-950-21105
REGULATOR LSN	108-950-00100	
PRESSURE REGULATOR	108-950-00208	

VDPP 90	RIGHT	LEFT
SEALS	108-950-50897	
SEALS SAE	108-950-50904	
DISTRIBUTOR PLATE	108-950-10902	108-950-20900
REGULATOR LSN	108-950-00100	
PRESSURE REGULATOR	108-950-00208	

SUCTION FLANGE

N	PUSH-ON FLANGE			FLANGE WITH THREAD
	45°	90°	STRAIGHT	STRAIGHT
Ø50	108-950-35045 h=96 k=40	108-950-35090 h=53 k=84	108-950-35000 h=65	
Ø64	108-950-36445 h=96 k=40	108-950-36490 h=109 k=129	108-950-36400 h=90	
G 1" 1/2				108-950-41129 h=28.5
G 1" 1/4				108-950-41147 h=21
	 b = 6.2mm	 b = 6.2mm	 b = 6.2mm	 b = 6.2mm