GEAR PUMPS

Member of the Danfoss Group
TUROLLA
fast forward thinking

shhark® continuum® PUMPS

Group 1 | Technical Information

shhark continuum
when less is more

History of revisions

Date	Page	Changed	Rev.
May 2016	All	First edition	A

Reference documents

Title	Type
Group 1 *shhark® continuum®* Pumps	Technical Information
Group 2 *shhark® continuum®* Pumps	Technical Information
Group 3 *shhark® continuum®* Pumps	Technical Information
Group 4 *shhark® continuum®* Pumps	Technical Information
Hydraulic Fluids and Lubricants	Technical Information

Index

General Information

4 Overview
4 The innovation behind *shhark® continuum®* pumps
5 Pump design
5 Features and benefits
5 Pump displacements

Technical Data

6 Technical data

Product Code

7 Model code

Determination of Nominal Pump Sizes

10 Based on SI units/Based on US units

System Requirements

11 Pressure
12 Hydraulic fluids
12 Temperature and viscosity
13 Filtration
13 Filters
13 Selecting a filter
14 Reservoir
14 Pump life
15 Sound levels

Pump Performance

16 Performance graphs

Product Options

18 Flange, shaft and ports configurations
19 Shaft options
20 Pumps with integral relief valve
21 Variant codes for ordering integral relief valves

Dimensions

22 SHCP28 - 01BA
23 SHCP28 - 02BB
24 SHCP28 - 03CN
25 SHCP28 - 06GA
26 SHCP28 - 03CO
27 SHCP28 - 08CO
28 SHCP28 - 08CN
29 SHCP28 - 03CL
30 SHCP28 - 08CL

General information

Overview

Turolla Group 1 *shhark® continuum®* pump is a range of peak performance fixed displacement gear pumps. Constructed of a high-strenght aluminium body with cast iron cover and flange, all pumps are pressure balanced for exceptional efficiency. The flexibility of the range, combined with high efficiency and low noise, makes the pumps in this series ideal for a wide range of applications, including: turf care, aerial lifts, material handling and power packs.

Group 1 *shhark® continuum®* pumps representatives:

SHCP28 01BA

SHCP28 06GA

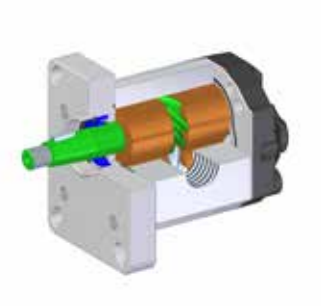
SHCP28 03CN

The innovation behind ***shhark® continuum®*** pumps

The *shhark® continuum®* combines the advantages of external gears and screw pumps into a novel design able of dramatically reducing the sound pressure level.
Likewise classic gear pumps, the transport of the fluid is perpendicular to the axis of the gears; however the special shape of the teeth is such that the meshing occurs through just one point of contact, preventing the formation of any trapped volume.
Any over-pressurization and/or cavitation phenomena associated with the meshing process is thereby eliminated by design, with a drastic reduction of the hydraulic sources of noise.
The helix profile increases the low contact ratio resulting from the two conjugated profiles in the direction normal to the axis and ensures a gentle transmission, further reducing also the mechanical source of noise.
The lateral bushes do not present any relief pocket since trapped volumes are never generated, however an internal hydrostatic mechanism has been engineered to compensate the additional thrust generated by the helix design and maintain higher volumetric efficiency over a wide range of operating conditions.

Pump design

SHCP28 01BA cutaway



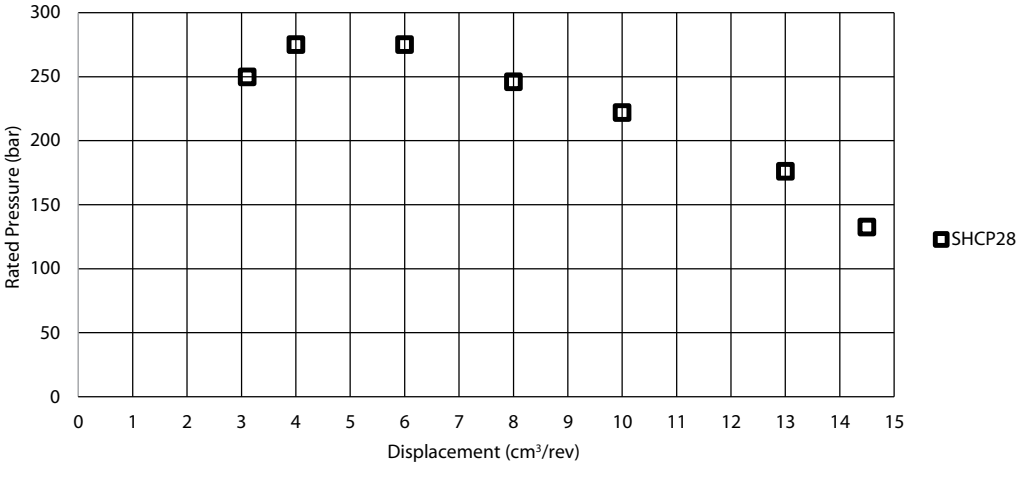
Features and benefits

shhark® continuum® pump attributes

- Displacements from 3.1 to 14.5 cm^3/rev [from 0.19 to 0.89 in^3/rev]
- Continuous pressure rating up to 250 bar [3625 psi]
- Speeds up to 3500 min^{-1} (rpm)
- SAE, ISO, and DIN mounting flanges and shafts available
- Compact, lightweight, quiet operation
- You can combine groups 1,2,3 to make multi- stage pumps

Pump displacements

Quick reference chart for pump displacements vs. rated pressure



Technical Data

		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Displacement	cm^3/rev [in^3/rev]	4.2 [0.26]	6.4 [0.39]	8.3 [0.51]	10.2 [0.62]	12.9 [0.79]
Peak pressure	bar [psi]	270 [3916]	250 [3626]	220 [3190]	270 [3916]	250 [3626]
Rated pressure		250 [3626]	230 [3336]	200 [2900]	220 [3190]	175 [2538]
Minimum speed	min^{-1} (rpm)	500*	500*	500*	500*	500*
Maximum speed		3500	3500	3500	2000	2000
Weight	kg [lb]	2.35 [5.2]	2.35 [5.2]	2.35 [5.2]	2.55 [5.6]	2.55 [5.6]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lb•ft^2]	13.0 [308]	17.1 [405]	20.8 [493]	24.5 [580]	29.4 [696]
Theoretical flow at maximum speed	l/min [US gal/min]	14.7 [3.9]	22.4 [5.9]	29.0 [7.6]	20.4 [5.4]	25.8 [6.8]

* Below 1000 rpm please contact your Turolla representative

Caution

The rated and peak pressure mentioned are for pumps with flanged ports only. When threaded ports are required a de-rated performance has to be considered. To verify the compliance of an high pressure application with a threaded ports pump apply to a Turolla representative.

Product code
Model code

A Family

SHCP28	Group 1 Pump (from 3.1cc up to 14.5cc)

B Displacement

SHCP28	
003	Displacement 3.1 cc *
3.5	Displacement 3.5 cc *
004	Displacement 4.2 cc
005	Displacement 5 cc *
006	Displacement 6.4 cc
008	Displacement 8.3 cc
010	Displacement 10.2 cc
012	Displacement 12.5 cc *
013	Displacement 12.9 cc
014	Displacement 14.5 cc *

*For this displacement please contact your Turolla representative

C Rotation

R	Right (Clockwise)
L	Left (Counterclockwise) *

*For this option please contact your Turolla representative

D Project version

N	Standard gear pump

A B C D E F G H I J K L M N 0

E Mounting flange

Code	Description (Type of flange • Type of drive gear • Preferred ports for configuration)
01	pilot Ø25,4+4 holes
02	pilot Ø30+4 holes
03	pilot Ø32+O-ring+2 holes through body
06	SAEA-A pilot Ø50,8+2 holes
08	pilot Ø32+O-ring Outlet port+2 holes through body

F Drive gear *

BA	Taper 1:8-M7-Key 2.41
BB	Taper 1:8-M10x1-Key 3
GA	Parallel Ø12,7-Key 3,2
CN	Tang 5x13,5, 12 mm from flange
CO	Tang 5x13,5, -0,65 mm from flange
CL	Tang 7x13,5, 12 mm from flange**

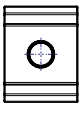
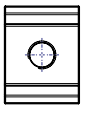
*For DIN 5482 GT and ANSI 9T options please contact your Turolla representative

** Available from 10cc

G Rear cover

P1	Std Cover pump
08	Cover 08 with Inlet port 3/8" Gas
C1	Cover pump with front Gas Thread Inlet 3/8; Outlet 3/8
I1	Cover pump with relief valve

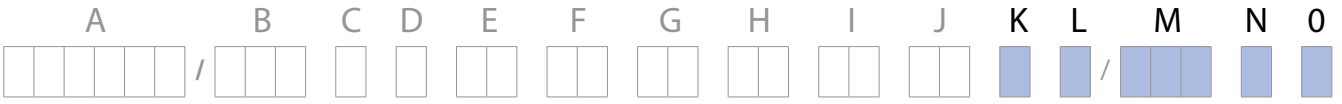
H Inlet size * I Outlet size *

E4	3/4-16 UNF	
F3	3/8 GAS	
F4	1/2 GAS	

*For flanged port options please contact your Turolla representative

J Port position & special body

NN	Std from catalogue



K Seals

N	Standard NBR seals
B	VITON seals
D	VITON seals with dust lip

L Screws *

N	Std screws

*For galvanized screws please contact your Turolla representative

M Set valve

NNN	No valve
V**	Integral relief pressure setting

** for details go to 27

N Type mark

N	Standard Turolla Marking
A	Standard Turolla Marking+Customer Code
Z	Without Marking

O Mark position

N	Standard Marking position (on top)
A	Special Marking position on the bottom

Determination of Nominal Pump Sizes

Based on SI units/Based on US units

Use these formulae to determine the nominal pump size for a specific application.

	Based on SI units	Based on US units
Output flow	$Q = \frac{Vg \cdot n \cdot \eta_v}{1000}$ l/min	$Q = \frac{Vg \cdot n \cdot \eta_v}{231}$ [US gal/min]
Input torque	$M = \frac{Vg \cdot \Delta p}{20 \cdot \pi \cdot \eta_m}$ N•m	$M = \frac{Vg \cdot \Delta p}{2 \cdot \pi \cdot \eta_m}$ [lbf•in]
Input power	$P = \frac{M \cdot n}{9550} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t}$ kW	$P = \frac{M \cdot n}{63.025} = \frac{Q \cdot \Delta p}{1714 \cdot \eta_t}$ [hp]

Variables: *SI units [US units]*

V_g	=	Displacement per rev.	cm^3/rev [in^3/rev]
p_{HD}	=	Outlet pressure	bar [psi]
p_{ND}	=	Inlet pressure	bar [psi]
Δp	=	$p_{HD} - p_{ND}$	bar [psi]
n	=	Speed	min^{-1} (rpm)
η_v	=	Volumetric efficiency	
η_m	=	Mechanical (torque) efficiency	
η_t	=	Overall efficiency ($\eta_v \cdot \eta_m$)	

System Requirements

Pressure

Inlet pressure

The inlet vacuum must be controlled within the prescribed range in order to achieve the expected pump life and performance.
The system design must meet inlet pressure requirements during all modes of operation.

Peak pressure is the highest intermittent pressure allowed. The reaction time of the pressure relief valve determines the duration of operation at pressure above the rated value. The maximum time interval is 100 ms. The illustration to the right shows peak pressure in relation to rated pressure and reaction time (100 ms maximum).

Rated pressure is the average, regularly occurring, operating pressure that does not compromise the product's life and performance.

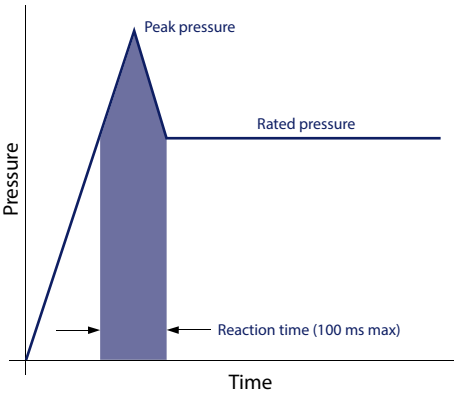
System pressure is the pressure differential between the outlet and inlet ports. System pressure must remain at, or below, the rated pressure during normal operation to achieve expected life.

Inlet pressure

Max. continuous vacuum	bar abs.	0.8 [23.6]
Max. pressure*	[in. Hg]	3.0 [88.5]

* Max 1 bar for tang shaft option

Time versus pressure



Hydraulic fluids

Ratings and data for SHCP28 *shhark® continuum®* pumps are valid for operation with premium hydraulic fluids containing oxidation, rust, and foam inhibitors. These fluids must possess good thermal and hydrolytic stability to prevent wear, erosion, and corrosion of internal components. They include:

- Hydraulic fluids following DIN 51524, part 2 (HLP) and part 3 (HVLP) specifications
- API CD engine oils conforming to SAE J183
- M2C33F or G automatic transmission fluids
- Certain agricultural tractor fluids

Use only clean fluid in the pump and hydraulic circuit.

Caution

Never mix hydraulic fluids.

Please see Turolla publication Hydraulic Fluids and Lubricants Technical Information, **L1021414** for more information.

Temperature and viscosity

Temperature and viscosity requirements must be concurrently satisfied. Use petroleum / mineral-based fluids.

High temperature limits apply at the inlet port to the pump. The pump should run at or below the maximum continuous temperature. The peak temperature is based on material properties. Don't exceed it.

Cold oil, generally, doesn't affect the durability of pump components. It may affect the ability of oil to flow and transmit power. For this reason, keep the temperature at 16 °C [60 °F] above the pour point of the hydraulic fluid.

Minimum (cold start) **temperature** relates to the physical properties of component materials.

Minimum viscosity occurs only during brief occasions of maximum ambient temperature and severe duty cycle operation. You will encounter maximum viscosity only at cold start. During this condition, limit speeds until the system warms up. Size heat exchangers to keep the fluid within these limits. Test regularly to verify that these temperatures and viscosity limits aren't exceeded. For maximum unit efficiency and bearing life, keep the fluid viscosity in the recommended viscosity range.

Fluid viscosity

Maximum (cold start)	mm^2/s [SUS]	1000 [4600]
Recommended range		32-150* [148-695]
Minimum		10 [60]

Temperature

Minimum (cold start)	°C [°F]	-20 [-4]
Maximum continuous		80 [176]
Peak (intermittent)		90 [194]

*For viscosity value out of this range, please contact Turolla.

Filtration

Filters

A Class 18/17/14 of ISO 4406 (or better) filter must be used.

Selecting a filter

When selecting a filter, please consider:

- Contaminant ingression rate
  (determined by factors such as the number of actuators used in the system)
- Generation of contaminants in the system
- Required fluid cleanliness
- Desired maintenance interval
- Filtration requirements of other system components

Measure filter efficiency with a Beta ratio (β_X). For:

- Suction filtration, with controlled reservoir ingression, use a $\beta_{35\text{-}45} = 75$ filter
- Return or pressure filtration, use a pressure filtration with an efficiency of $\beta_{10} = 75$.

βx ratio is a measure of filter efficiency defined by ISO 4572. It is the ratio of the number of particles greater than a given diameter ("$_x$" in microns) upstream of the filter to the number of these particles downstream of the filter.

Fluid cleanliness level and βx ratio

Fluid cleanliness level (per ISO 4406)	Class 18/17/14 or better
β_x ratio (suction filtration)	$\beta_{35\text{-}45} = 75$ and $\beta_{10} = 2$
β_x ratio (pressure or return filtration)	$\beta_{10} = 75$
Recommended inlet screen size	100-125 µm [0.004-0.005 in]*

*From 25 to 10 µm for heavy duty operations.

The filtration requirements for each system are unique. Evaluate filtration system capacity by monitoring and testing prototypes.

Reservoir

The **reservoir** provides clean fluid, dissipates heat, removes entrained air and makes up for changes in fluid volume due to fluid expansion-contraction and flow imbalances associated with differential cylinders. A correctly sized reservoir accommodates maximum volume changes during all system operating modes. It promotes de-aeration of the fluid as it passes through, and accommodates a fluid dwell-time between 60 and 180 seconds, allowing entrained air to escape.
Hydraulic oil contains 10% of dissolved air by volume in normal conditions and the system should be design in order to avoid any over-areation of the hydraulic fluid, to limit any air release at the inlet port.

Minimum reservoir capacity depends on the volume required to cool and hold the oil from all retracted cylinders, allowing for expansion due to temperature changes. A fluid volume of 1 to 3 times the pump output flow (per minute) is satisfactory. The minimum reservoir capacity is 125% of the fluid volume.

The suction line shall be installed above the bottom of the reservoir to take advantage of gravity separation and prevent large foreign particles from entering the line. Cover the line with a 100-125 micron screen. The pump should be below the lowest expected fluid level.

Put the return-line below the lowest expected fluid level to allow discharge into the reservoir for maximum dwell and efficient deaeration. A baffle (or baffles) between the return and suction lines promotes deaeration and reduces fluid surges.

Pump life

Pump life is a function of speed, system pressure, and other system parameters (such as fluid quality and cleanliness).

All Turolla *shhark® continuum®* pumps use hydrodynamic journal bearings that have an oil film maintained between the gear/shaft and bearing surfaces at all times. If the oil film is sufficiently sustained through proper system maintenance and operating within recommended limits, long life can be expected.

B_{10} life expectancy number is generally associated with rolling element bearings. It does not exist for hydrodynamic bearings.

High pressure, resulting from high loads, impacts pump life. When submitting an application for review, provide machine duty cycle data that includes percentages of time at various loads and speeds. We strongly recommend a prototype testing program to verify operating parameters and their impact on life expectancy before finalizing any system design.

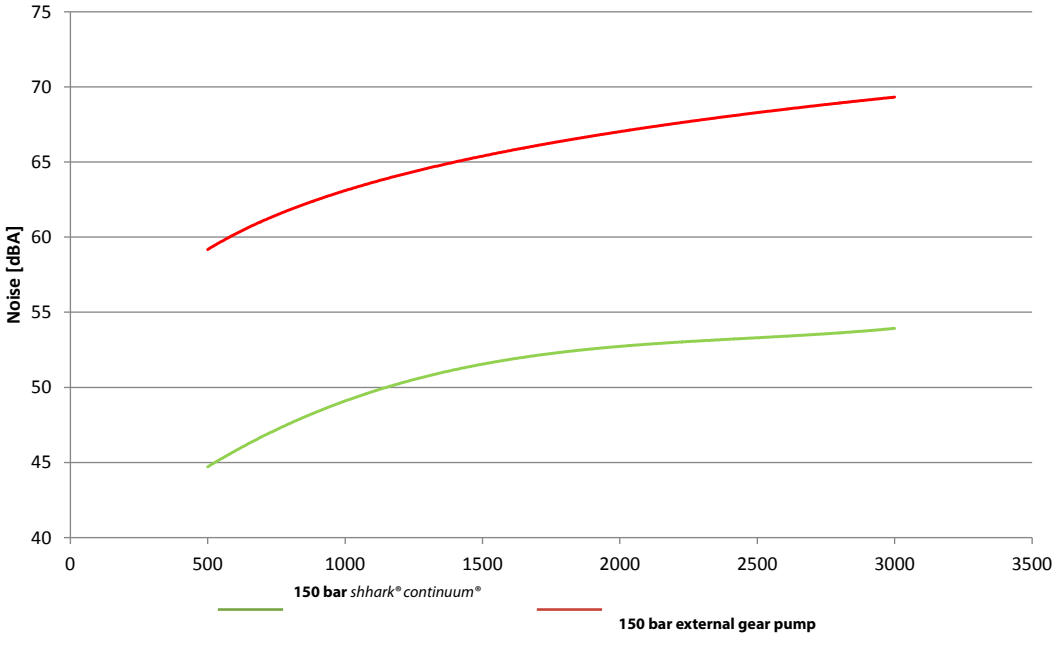
Sound levels

High pressure hydrostatic pumps and motors are characterized by noise and/or vibration levels that may be inconvenient for certain applications. Turolla *shhark® continuum®* pumps represent a novel and unique generation of gear pumps which eliminate the most significant sources of noise by design.

Thanks to the combination of helical design and single point contact operation, the *shhark® continuum®* achieves a reduction of 15dB(A) in the sound pressure level in comparison with standard gear pumps available on the market.

Contact your Turolla representative for assistance with system noise control.

Sound levels graph

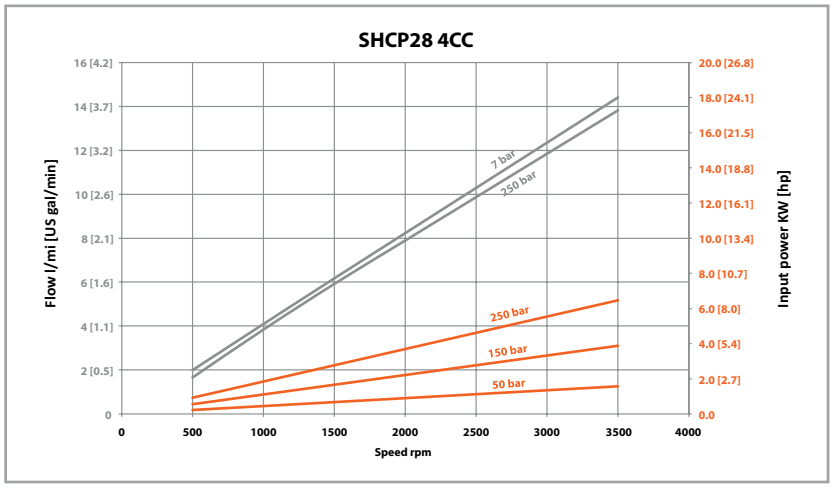


Pump Performance

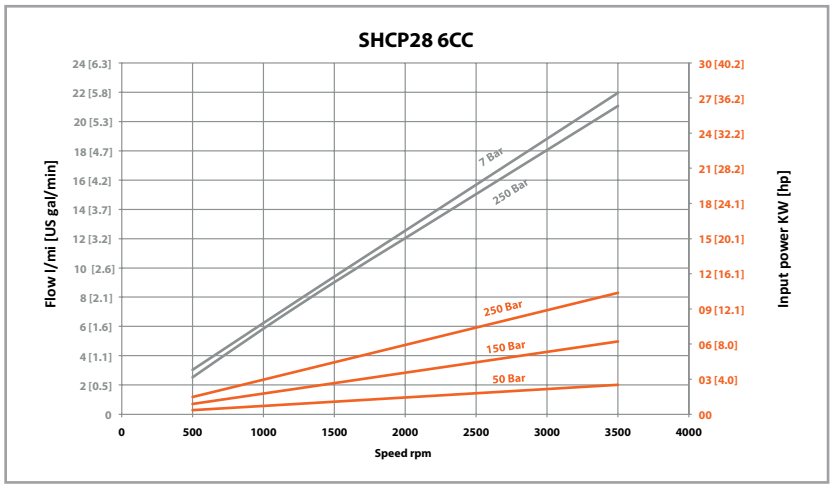
Performance graphs

The graphs on the next pages provide typical output flow and input power for Group 1 *shhark® continuum®* pumps at various working pressures. Data were taken using ISO VG46 petroleum / mineral based fluid at 50 °C (viscosity at 28 mm²/s [cSt]).

Performance graph for 004 frame size

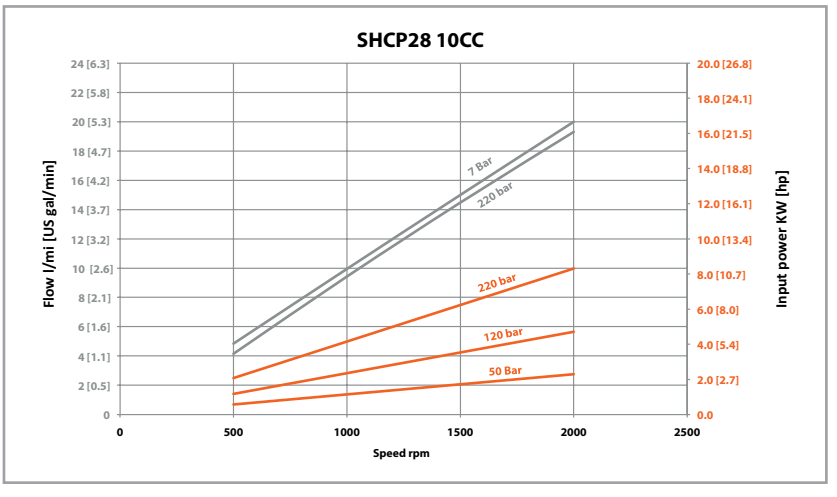


Performance graph for 006 frame size



Performance graph for 008 frame size

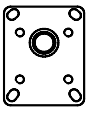
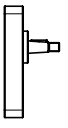
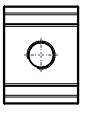
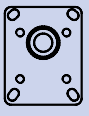
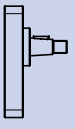
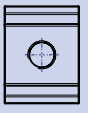
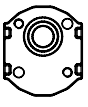
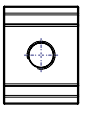
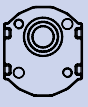
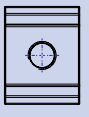
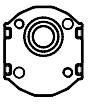
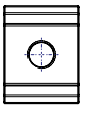
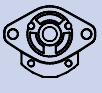
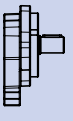
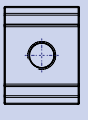
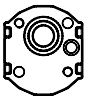
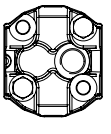
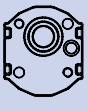
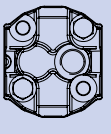
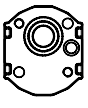
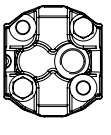
Performance graph for 010 frame size



Performance graph for 013 frame size

Product Options

Flange, shaft and ports configurations SHCP28

Code	Flange		Shaft		Ports	
01BA	Pilot Ø25.4+4 holes		Taper 1:8 - M7 key 2.41		Threaded GAS (BSPP)	
02BB	Pilot Ø30+4 holes		Taper 1:8 - M10 key 3		Threaded GAS (BSPP)	
03CL	Pilot Ø32+O-ring+2 holes through body		Tang 7x13.5 12 mm from flange		Threaded GAS (BSPP)	
03CN	Pilot Ø32+O-ring+2 holes through body		Tang 5x13.5 12 mm from flange		Threaded GAS (BSPP)	
03CO	Pilot Ø32+O-ring+2 holes through body		Tang 5x13.5 - 0.65 mm from flange		Threaded GAS (BSPP)	
06GA	SAEA-A pilot Ø50.8+2 holes		Parallel Ø12.7 - key 3.2		Threaded SAE O-Ring boss	
08CL	Pilot Ø32+O-ring Outlet port+2 holes through body		Tang 7x13.5 - 12 mm from flange		Threaded GAS (BSPP)	
08CN	Pilot Ø32+O-ring Outlet port+2 holes through body		Tang 5x13.5 - 12 mm from flange		Threaded GAS (BSPP)	
08CO	Pilot Ø32+O-ring Outlet port+2 holes through body		Tang 5x13.5 - 0.65 mm from flange		Threaded GAS (BSPP)	

Shaft options

Direction is viewed facing the shaft. Group 1 *shhark® continuum®* pumps are available with a variety of tang, splined, parallel, and tapered shaft ends. Not all shaft styles are available with all flange styles.

Shaft availability and nominal torque capability

Shaft		**Mounting flange code with maximum torque** in N•m [lbf•in]				
Description	*Code*	**01**	**02**	**03**	**06**	**08**
Taper 1:8 - M7 - Key 2.41	**BA**	25 [221]	–	–	–	–
Taper 1:8 - M10x1 - Key 3	**BB**	–	50 [442]	–	–	–
Tang 5x13.5 -0.65 mm from flange	**CO**	–	–	21 [186]	–	21 [186]
Tang 5x13.5 12 mm from flange	**CN**	–		21 [186]	–	21 [186]
Tang 7x13.5 12 mm from flange	**CL**	–		25 [221]	–	25 [221]
Parallel Ø 12.7 key 3.2	**GA**	–	–	–	32 [283]	–

Caution

Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

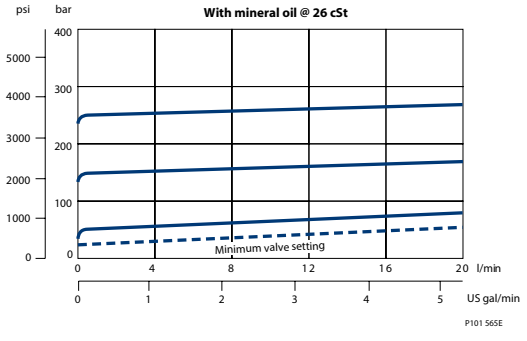
Pumps with integral relief valve*

Group 1 *shhark® continuum®* pumps are offered with an optional **integral relief valve** in the rear cover. It is drained internally and directs all flow from the pump outlet to the inlet when the outlet pressure reaches the valve setting.

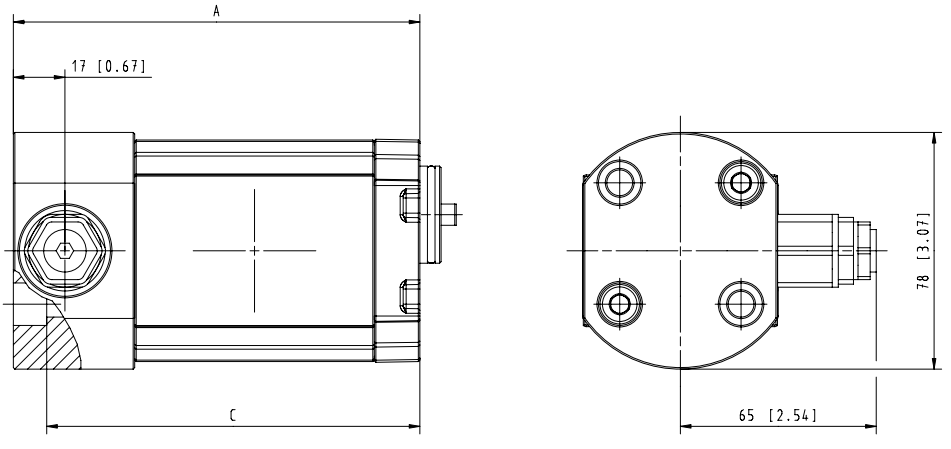
Caution

When the relief valve is operating in bypass condition, rapid heat generation occurs. If this bypass condition continues, the pump prematurely fails. The reason for this is that it is a rule, not an exception.

Valve performance graph



Dimensions



Integral relief valve and covers dimensions						
Type (displacemnt)		004	006	008	010	013
Dimensions mm [in]	**A**	114.0 [4.49]	119.5 [4.70]	124.5 [4.90]	129.5 [5.10]	136.4 [5.37]
	C	105.0 [4.13]	110.5 [4.35]	115.5 [4.55]	120.5 [4.74]	127.4 [5.01]

Integral relief valve and covers dimensions for SHCP28-03CL					
Type (displacemnt)		010	012	013	014
Dimensions mm [in]	**A**	129.5 [5.10]	134.0 [5.27]	136.4 [5.37]	140.6 [5.53]
	C	120.5 [4.74]	125.0 [4.92]	127.4 [5.01]	131.6 [5.18]

* Please, contact Turolla for this option.

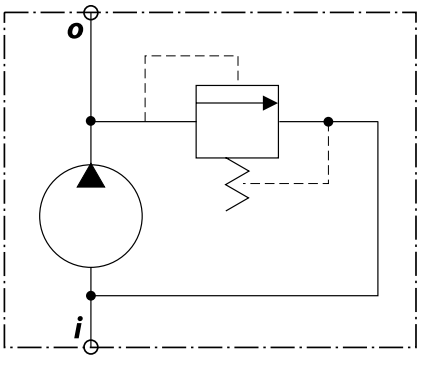
Variant codes for ordering integral relief valves*

The tables below detail the various codes for ordering integral relief valves.

Code	Pump speed for RV setting
A	Not defined
C	500 min^{-1} (rpm)
E	1000 min^{-1} (rpm)
F	1250 min^{-1} (rpm)
G	1500 min^{-1} (rpm)
K	2000 min^{-1} (rpm)
I	2250 min^{-1} (rpm)
L	2500 min^{-1} (rpm)
M	2800 min^{-1} (rpm)
N	3000 min^{-1} (rpm)
O	3250 min^{-1} (rpm)

Code	Pressure setting
A	No setting
B	No valve
C	18 bar [261 psi]
D	25 bar [363 psi]
E	30 bar [435 psi]
F	35 bar [508 psi]
G	40 bar [580 psi]
K	50 bar [725 psi]
L	60 bar [870 psi]
M	70 bar [1015 psi]
N	80 bar [1160 psi]
O	90 bar [1305 psi]
P	100 bar [1450 psi]
Q	110 bar [1595 psi]
R	120 bar [1740 psi]
S	130 bar [1885 psi]
T	140 bar [2030 psi]
U	160 bar [2320 psi]
V	170 bar [2465 psi]
W	180 bar [2611 psi]
X	210 bar [3046 psi]
Y	240 bar [3480 psi]
Z	250 bar [3626 psi]

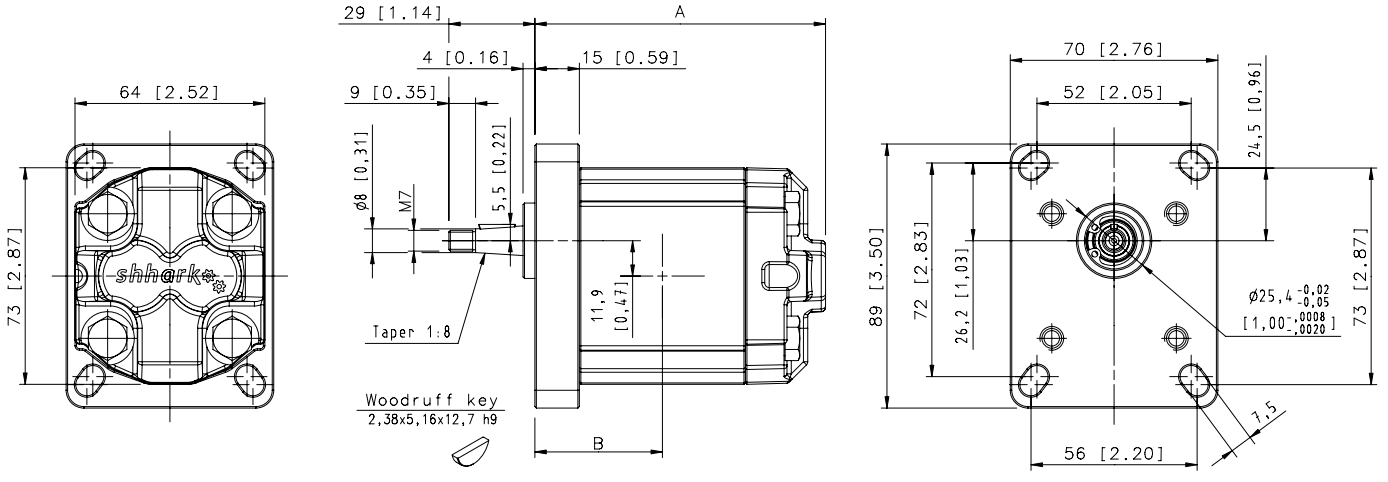
Integral relief valve schematic



* Please, contact Turolla for this option.

Dimensions

SHCP28 - 01BA



SHCP28 - 01BA dimensions

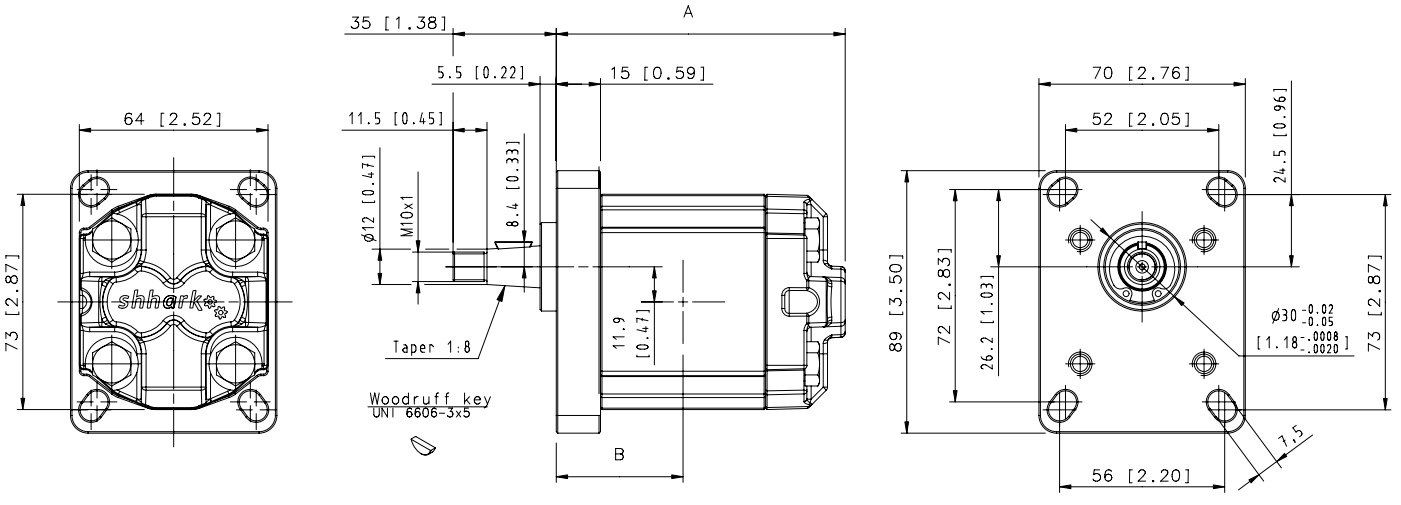
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	44.5 [1.75]	47.25 [1.86]	49.75 [1.96]	52.25 [2.06]	55.55 [2.19]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
01BA	SHCP28/004RN01BAP1F4F4NNNN/NNNNN	25 N•m [221 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 02BB



SHCP28 - 02BB dimensions

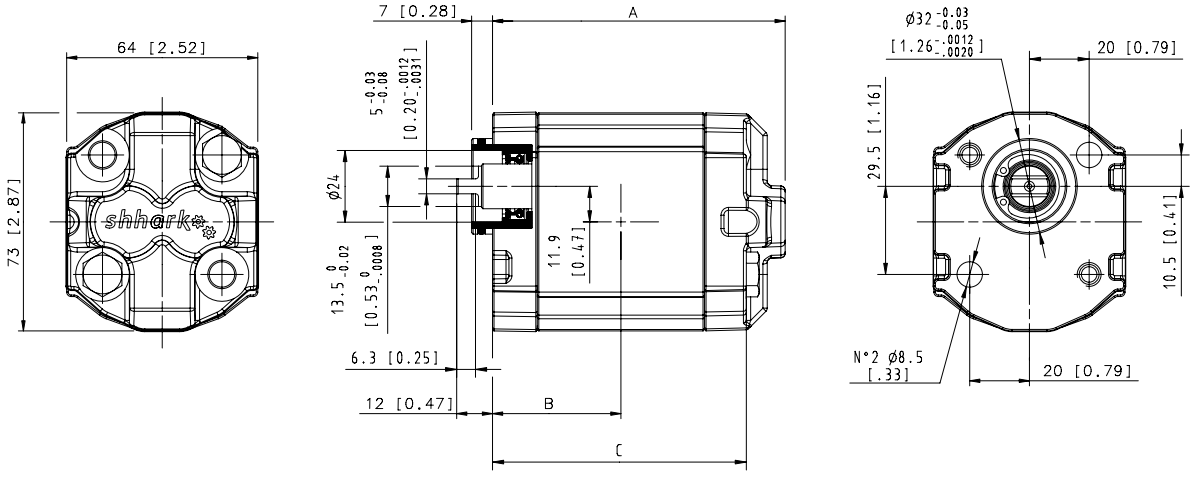
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	44.5 [1.75]	47.25 [1.86]	49.75 [1.96]	52.25 [2.06]	55.55 [2.19]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
02BB	SHCP28/004RN02BBP1F4F4NNNN/NNNNN	50 N•m [442 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 03CN



SHCP28 - 03CN dimensions

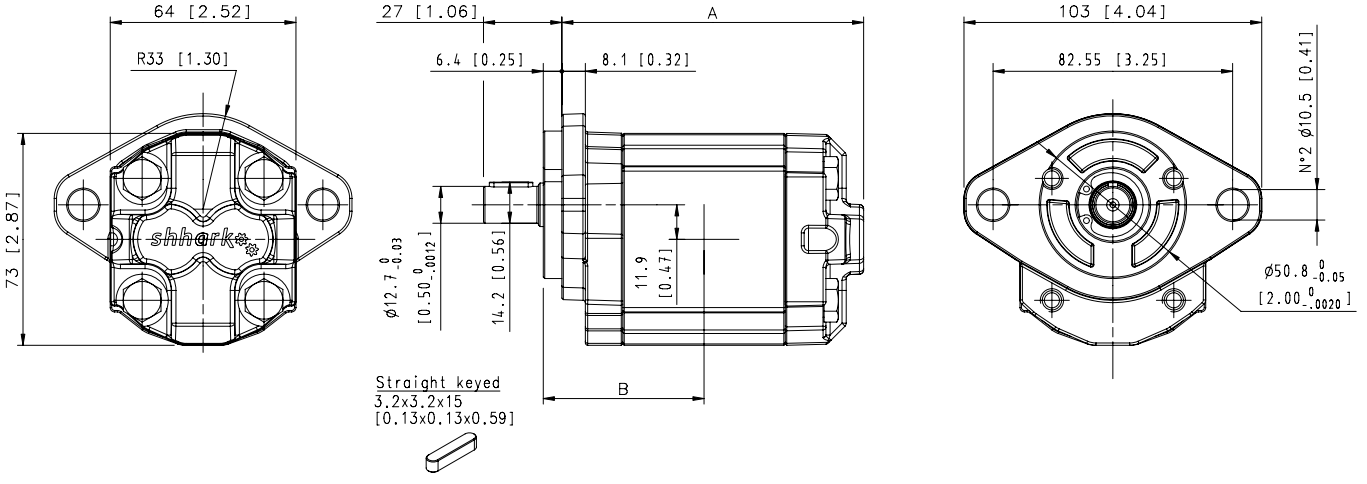
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	44.5 [1.75]	47.25 [1.86]	49.75 [1.96]	52.25 [2.06]	55.55 [2.19]
Dimensions mm [in]	**C**	87.0 [3.42]	92.5 [3.64]	97.5 [3.84]	102.5 [4.03]	109.4 [4.31]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
03CN	SHCP28/004RN03CNP1F4F4NNNN/NNNNN	21 N•m [186 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 06GA



SHCP28 - 06GA dimensions

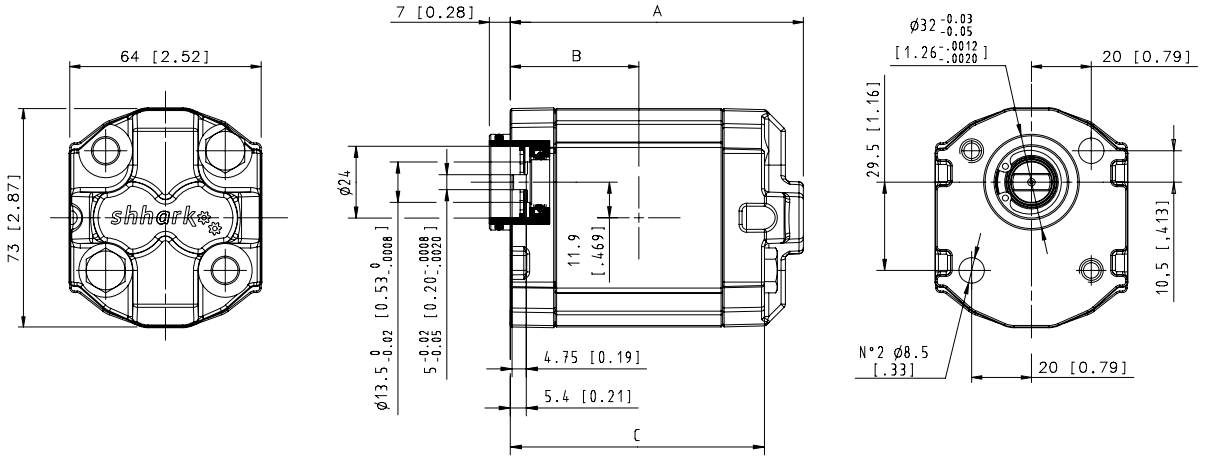
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	107.0 [4.21]	112.5 [4.43]	117.5 [4.62]	122.5 [4.82]	129.4 [5.09]
Dimensions mm [in]	**B**	50.50 [1.99]	53.25 [2.10]	55.75 [2.19]	58.25 [2.29]	61.70 [2.43]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
06GA	SHCP28/008RN06GAP1F4F4NNNN/NNNNN	32 N•m [283 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 03CO



SHCP28 - 03CO dimensions

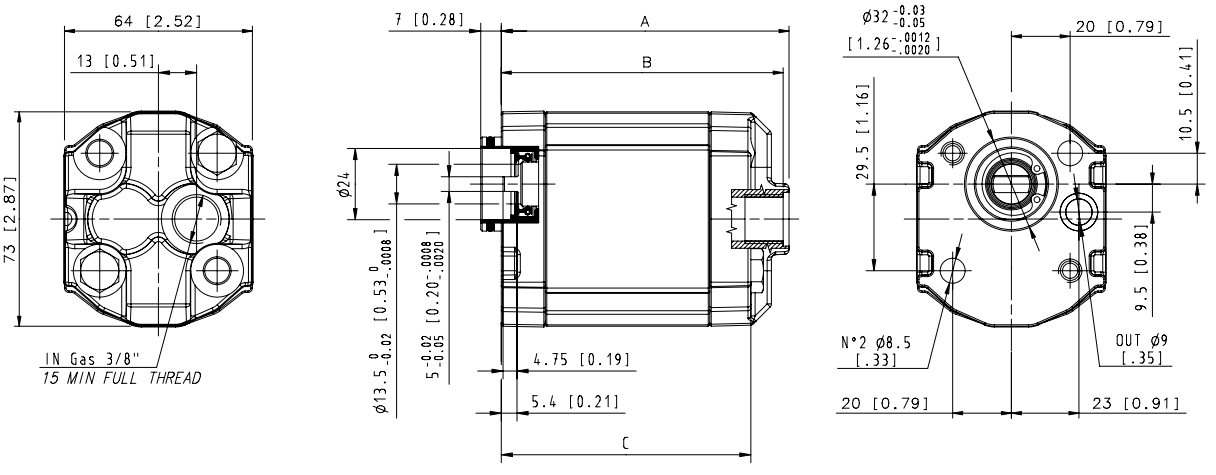
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	44.5 [1.75]	47.25 [1.86]	49.75 [1.96]	52.25 [2.06]	55.55 [2.19]
Dimensions mm [in]	**C**	87.0 [3.42]	92.5 [3.64]	97.5 [3.84]	102.5 [4.03]	109.4 [4.31]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
03CO	SHCP28/004RN03COP1F4F4NNNN/NNNNN	21 N•m [186 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 08CO



SHCP28 - 08CO dimensions

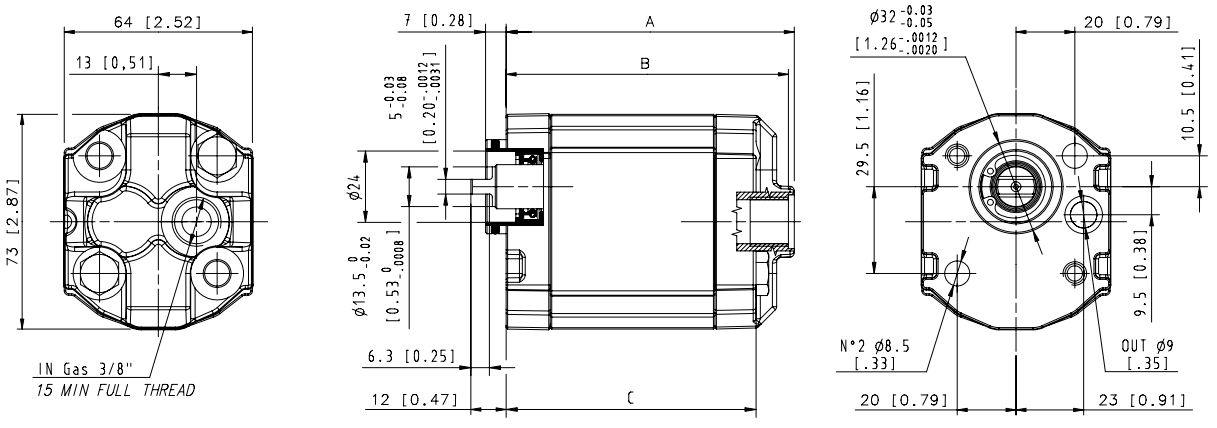
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	99.0 [3.89]	104.5 [4.11]	109.5 [4.31]	114.5 [4.50]	121.4 [4.77]
Dimensions mm [in]	**C**	87.0 [3.42]	92.5 [3.64]	97.5 [3.84]	102.5 [4.03]	109.4 [4.31]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
08CO	SHCP28/008RN08CO08NNNNNNNN/NNNNN	21 N•m [186 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 08CN



SHCP28 - 08CN dimensions

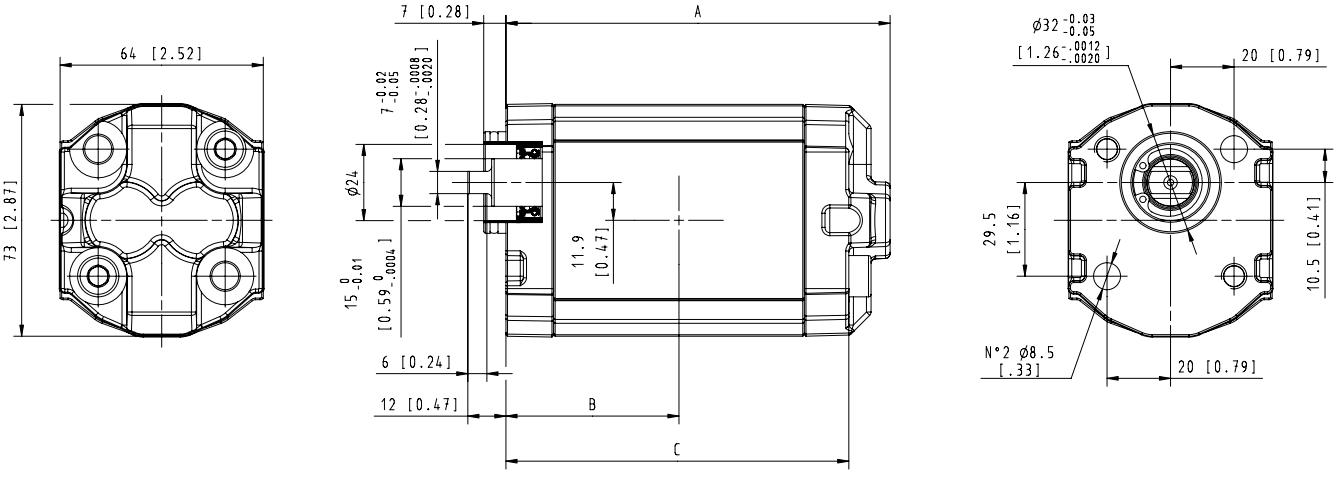
		SHCP28				
Frame size		**004**	**006**	**008**	**010**	**013**
Dimensions mm [in]	**A**	101 [3.98]	106.5 [4.19]	111.5 [4.39]	116.5 [4.59]	123.1 [4.85]
Dimensions mm [in]	**B**	99.0 [3.89]	104.5 [4.11]	109.5 [4.31]	114.5 [4.50]	121.4 [4.77]
Dimensions mm [in]	**C**	87.0 [3.42]	92.5 [3.64]	97.5 [3.84]	102.5 [4.03]	109.4 [4.31]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
08CN	SHCP28/006RN08CN08NNNNNNNN/NNNNN	21 N•m [186 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 03 CL



SHCP28 - 03CL dimensions

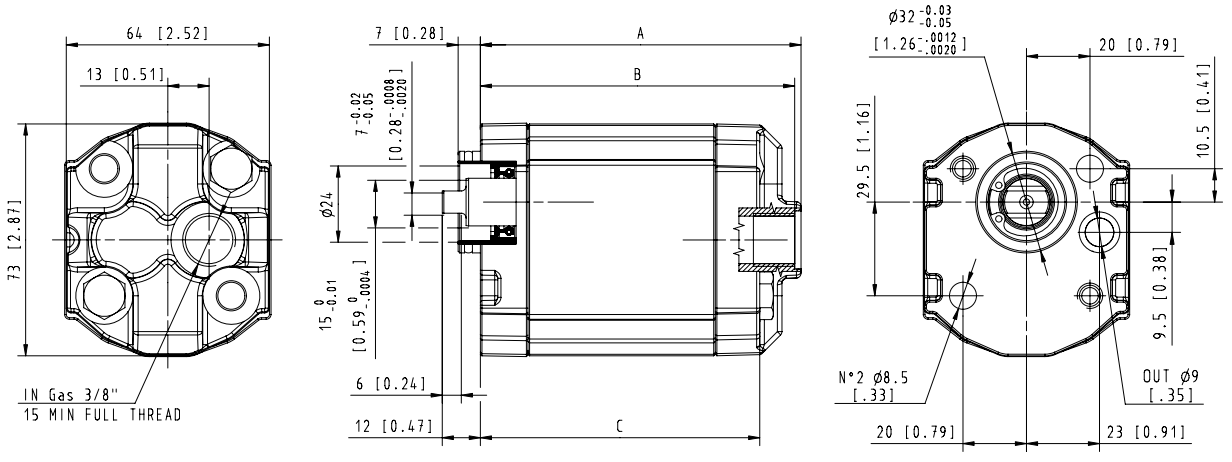
		SHCP28			
Frame size		**010**	**012**	**013**	**014**
Dimensions mm [in]	**A**	116.5 [4.59]	121.0 [4.76]	123.4 [4.86]	127.6 [5.02]
Dimensions mm [in]	**B**	52.3 [2.06]	54.5 [2.14]	55.7 [2.19]	57.8 [2.27]
Dimensions mm [in]	**C**	102.5 [4.03]	107.0 [4.21]	109.4 [4.31]	113.6 [4.47]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
03CL	SHCP28/010RN03CLP1F4F4NNNN/NNNNN	25 N•m [221 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

SHCP28 - 08CL



SHCP28 - 08CL relief valve dimensions

		SHCP28			
Frame size		**010**	**012**	**013**	**014**
Dimensions mm [in]	**A**	116.5 [4.59]	121.0 [4.76]	123.4 [4.86]	127.6 [5.02]
Dimensions mm [in]	**B**	114.5 [4.51]	119.0 [4.68]	121.4 [4.78]	125.6 [4.94]
Dimensions mm [in]	**C**	102.5 [4.03]	107.0 [4.21]	109.4 [4.31]	113.6 [4.47]

Model code examples and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
08CL	SHCP28/010RN08CL08NNNNNNNN/NNNNN	25 N•m [221 lbf•in]

For further details on ordering, see Model Code, pages 7-9.

Notes

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