EIPC3
EIPC5
EIPC6

Internal gear pumps

eckerle.com

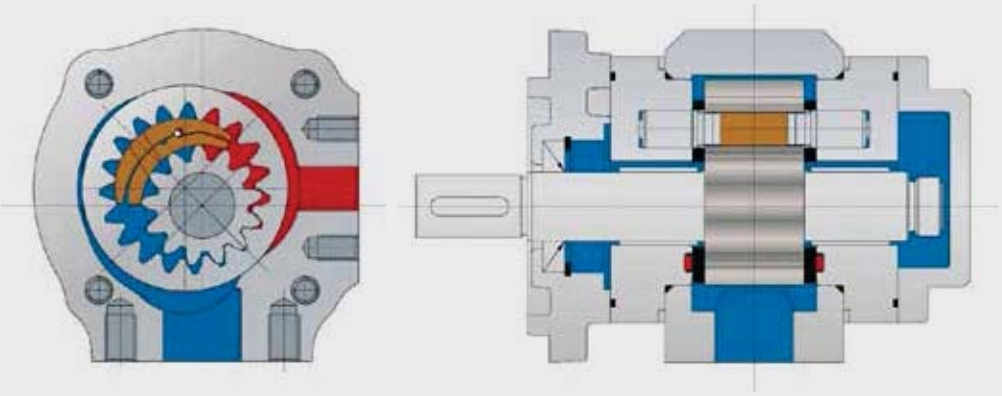
ECKERLE
HYDRAULIC DIVISION

Internal gear pump
Type EIPC3 for industrial applications with constant displacement volume

EIPC3

Characteristics

- Internal gear pump with axial and radial gap compensation
- Radial compensation with segments
- Suction and pressure port radial
- Field of application: Industrial hydraulic
- Low noise
- Long time life
- Low pulsation (pressure pulsation ~2 %)
- Multi flow combinations



Technical Data

Rated Size	020	025	032	040	050	063	064
Spec. volume Vth [cm^3/rev]***	20,0	24,8	32,1	40,1	50,3	63,1	64,4
Continuous operating pressure [bar]**	250					180	250
Peak operating pressure [bar] max. 10 sec 15 % duty cycle**	320			300	280	210	280
Cut-in pressure peak [bar]**	350			325	300	210	300
Nominal speed [min^{-1}]	200 – 3.400	200 – 3.200	200 – 3.000	100 – 2.500	100 – 1.800		100 – 1.800
Max. speed [min^{-1}]	3.900	3.800	3.700	2.500	1.800		1.800
Nominal speed [min^{-1}]****	For rated size 040-064 avalible			100 – 3.200	100 – 3.000	200 – 2.200	100 – 2.200
Max. speed [min^{-1}]****	For rated size 040-064 avalible			3.600	3.600	2.400	2.400
Operating viscosity [mm^2/s]	10 – 300						
Starting viscosity [mm^2/s]	2.000						
Operating temperature [°C]	-20 to +100						
Operating medium	HL – HLP DIN 51 524 part 1/2						
Max. medium temperature [°C]	120						
Min. medium temperature [°C]	-40						
Max. ambient temperature [°C]	80						
Min. ambient temperature [°C]	-40						
Max. admission pressure (intake side) [bar]	2 bar absolute						
Min. admission pressure (intake side) [bar]	0.8 bar absolute (Start 0.6)						
Weight appr. [kg]	8,3	8,6	9,2	9,8	10,5	10,5	11,5
Degree of filtration	Class 20/18/15 due to ISO 4406						
Life expectancy	not less than 1x 10^7 load cycles against peak operating pressure						
Efficiency η vol:	93	93	94	95	95	94	95
Efficiency η hm:	91	92	92	93	93	92	93
Pump noise* (measured in sound chamber) dB[A]	62	63	64	65	66	64	68

n = 1.450 min^{-1} Δ p = 250 bar (180 bar at size 063) T = 50 °C Medium: HLP 46

* Measured in anechoic room of Eckerle Hydraulic Division; Axial microphone distance 1.0 m
** For acceptable pressure at 400–1.800 rpm. Further rpm on request.
*** Due to manufacturing tolerances the displacement volume could vary.
**** 2" suction port

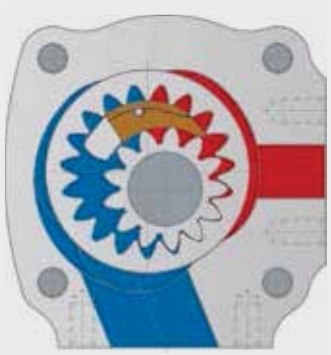
The pumps have no corrosion protection. The max. permissible values must not be applied cumulatively. Please contact us.

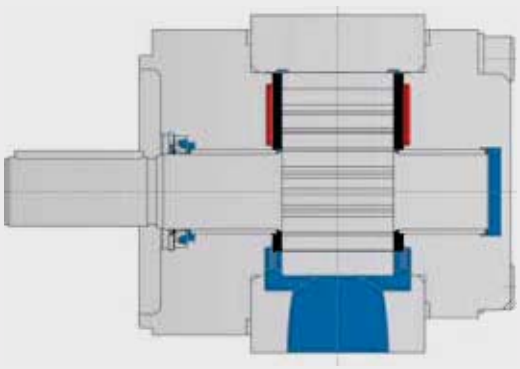
Internal gear pump
Type EIPC5 for industrial applications with constant displacement volume

EIPC5

Characteristics

- Internal gear pump with axial and radial gap compensation
- Radial compensation with segments
- Suction and pressure port radial
- Field of application: Industrial hydraulic
- Low noise
- Long time life
- Low pulsation (pressure pulsation ~2 %)
- Multi flow combinations on request





Technical Data

Rated Size	064	080	100
Spec. volume Vth [cm³/rev]***	65,3	80,4	100,5
Continuous operating pressure [bar]**	250		
Peak operating pressure [bar] max. 10 sec 15 % duty cycle**	270		
Cut-in pressure peak [bar]**	280		
Nominal speed [min⁻¹]	100 – 2.800	100 – 2.800	100 – 2.500
Max. speed [min⁻¹]	3.000	3.000	3.000
Operating viscosity [mm²/s]	10 – 300		
Starting viscosity [mm²/s]	2.000		
Operating temperature [°C]	-20 to +100		
Operating medium	HL – HLP DIN 51 524 part 1/2		
Max. medium temperature [°C]	120		
Min. medium temperature [°C]	-40		
Max. ambient temperature [°C]	80		
Min. ambient temperature [°C]	-40		
Max. admission pressure (intake side) [bar]	2 bar absolute		
Min. admission pressure (intake side) [bar]	0,8 bar absolute (Start 0,6)		
Weight appr. [kg]	11,5	13,0	13,5
Degree of filtration	Class 20/18/15 due to ISO 4406		
Life expectancy	not less than 1x 10^7 load cycles against peak operating pressure		
Efficiency η vol:	94	95	95
Efficiency η hm:	92	93	93
Pump noise* (measured in sound chamber) dB[A]	69	70	71

n = 1.450 min⁻¹ Δ p = 250 bar T = 50 °C Medium: HLP 46

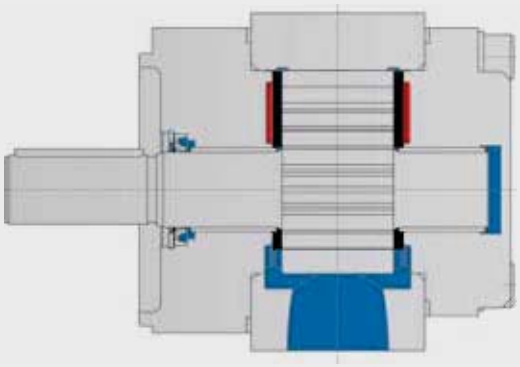
* Measured in anechoic room of Eckerle Hydraulic Division; Axial microphone distance 1.0 m
** For acceptable pressure at 400–1.800 rpm. Further rpm on request.
*** Due to manufacturing tolerances the displacement volume could vary.
The pumps have no corrosion protection. The max. permissible values must not be applied cumulatively. Please contact us.

Internal gear pump
Type EIPC6 for industrial applications with constant displacement volume

EIPC6

Characteristics

- Internal gear pump with axial and radial gap compensation
- Radial compensation with segments
- Suction and pressure port radial
- Field of application: Industrial hydraulic
- Low noise
- Long time life
- Low pulsation (pressure pulsation ~2 %)
- Multi flow combinations on request



Technical Data

Rated Size	125	160	200	250
Spec. volume Vth [cm^3/rev]***	125,7	160,1	200,9	249,9
Continuous operating pressure [bar]**	250		160	140
Peak operating pressure [bar] max. 10 sec 15 % duty cycle**	280		210	150
Cut-in pressure peak [bar]**	300		180	160
Nominal speed [min^{-1}]****	400 – 2.500	400 – 2.000		
Max. speed [min^{-1}]	2.800	2.200		
Operating viscosity [mm^2/s]	10 – 300			
Starting viscosity [mm^2/s]	2.000			
Operating temperature [°C]	-20 to +100			
Operating medium	HL – HLP DIN 51 524 part 1/2			
Max. medium temperature [°C]	80			
Min. medium temperature [°C]	-20			
Max. ambient temperature [°C]	80			
Min. ambient temperature [°C]	-20			
Max. admission pressure (intake side) [bar]	2 bar absolute			
Min. admission pressure (intake side) [bar]	0.8 bar absolute (Start 0.6)			
Weight appr. [kg]	27,5	30	43	54
Degree of filtration	Class 20/18/15 due to ISO 4406			
Life expectancy	not less than 1x 10^7 load cycles against peak operating pressure			
Efficiency η vol:	94	94	93	93
Efficiency η hm:	90		91	
Pump noise* (measured in sound chamber) dB[A]	76	77	77	78

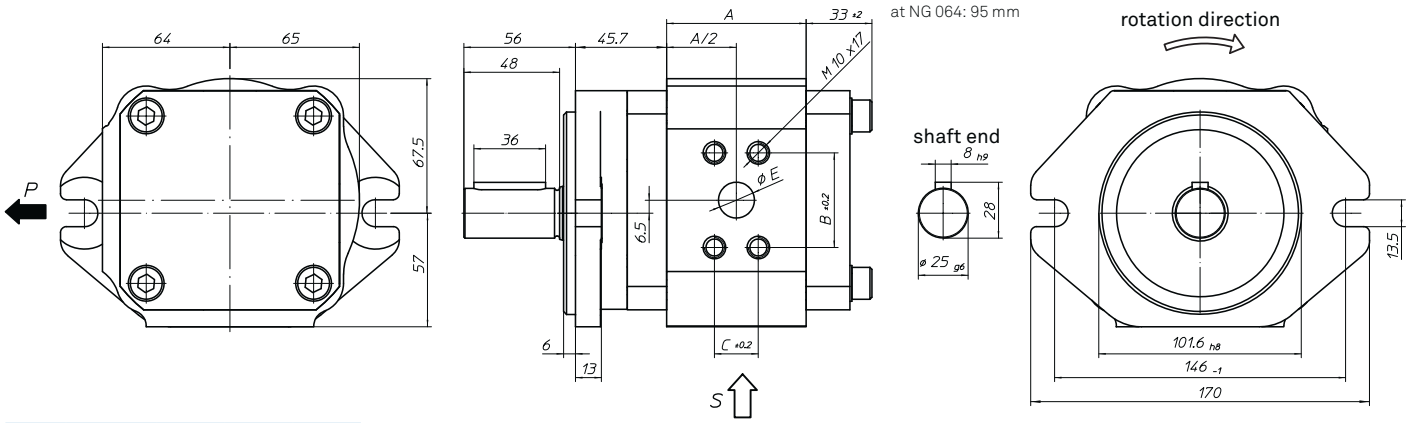
n = 1.450 min^{-1} Δ p = 250 bar (160 bar at size 200 and 140 bar at size 250) T = 50 °C Medium: HLP 46

* Measured in anechoic room of Eckerle Hydraulic Division; Axial microphone distance 1.0 m
** For acceptable pressure at 400–1.800 rpm. Further rpm on request.
*** Due to manufacturing tolerances the displacement volume could vary.
**** Further rpm on request.

The pumps have no corrosion protection. The max. permissible values must not be applied cumulatively. Please contact us.

Pump with SAE-2-B-hole flange and cylindrical shaft

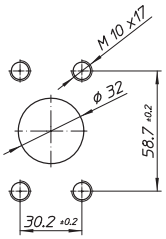
Order example: EIPC3-___RA23-1X



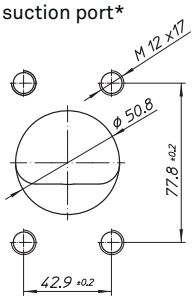
Size	A	B	C	E
020	58,5	47,5	22	18
025	65,0	47,5	22	18
028	70,0	47,5	22	18
032	75,0	47,5	22	18
040	86,0	52,4	26,2	20
050	100,0	52,4	26,2	20
063	118,0	52,4	26,2	25,4
064	100,0	52,4	26,2	20

* is suitable for speed controlled drive applications (available only for size 040, 050, 063, 064)

suction port

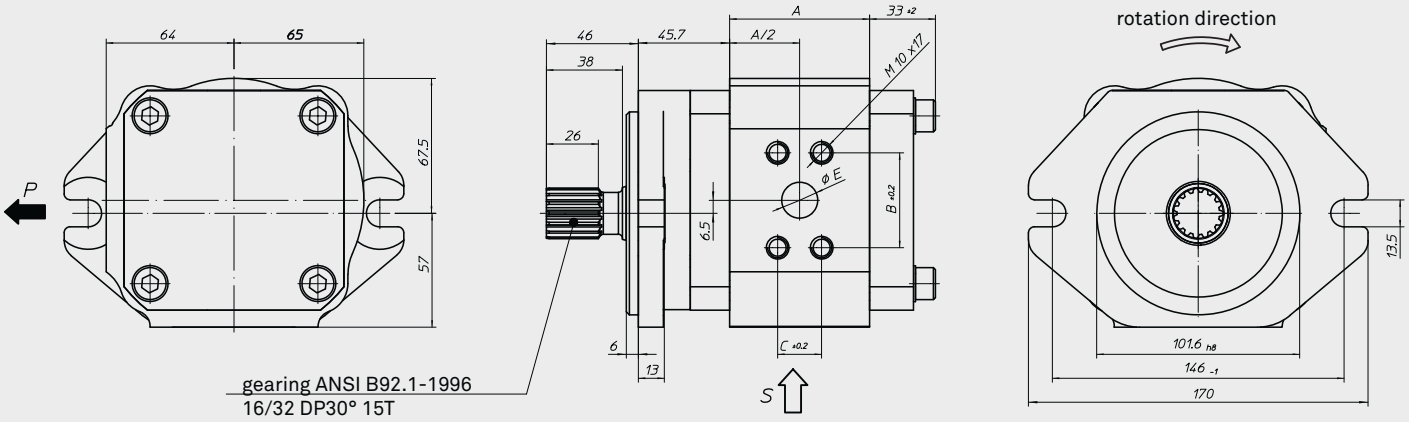


enlarged suction port*



Pump with SAE-2-B-hole flange and spline shaft

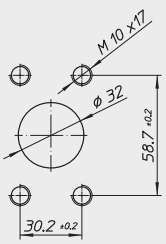
Bestellbeispiel: EIPC3-___RB23-1X



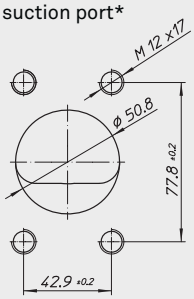
Size	A	B	C	E
020	58,5	47,5	22	18
025	65,0	47,5	22	18
028	70,0	47,5	22	18
032	75,0	47,5	22	18
040	86,0	52,4	26,2	20
050	100,0	52,4	26,2	20
063	118,0	52,4	26,2	25,4
064	100,0	52,4	26,2	20

* is suitable for speed controlled drive applications (available only for size 040, 050, 063, 064)

suction port

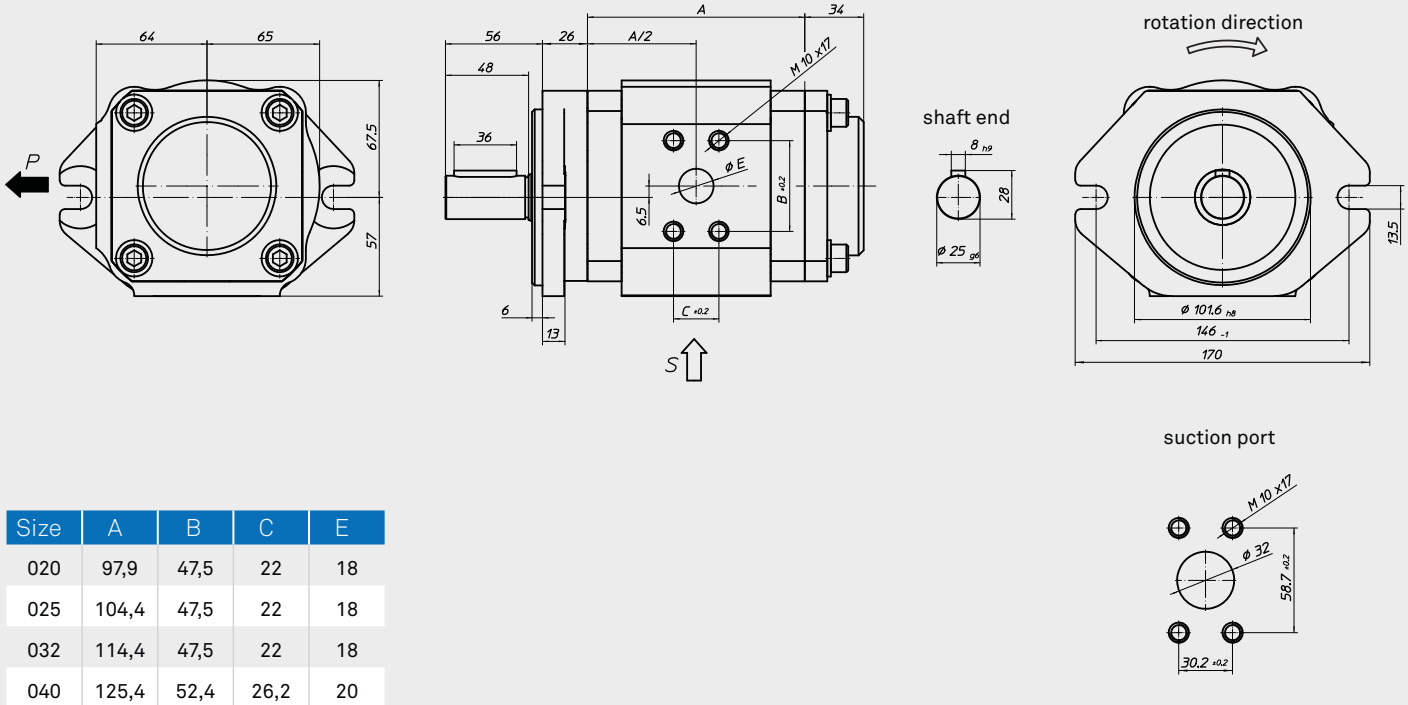


enlarged suction port*



Pump with SAE-B-2-hole flange and cylindrical shaft with PTO through drive option

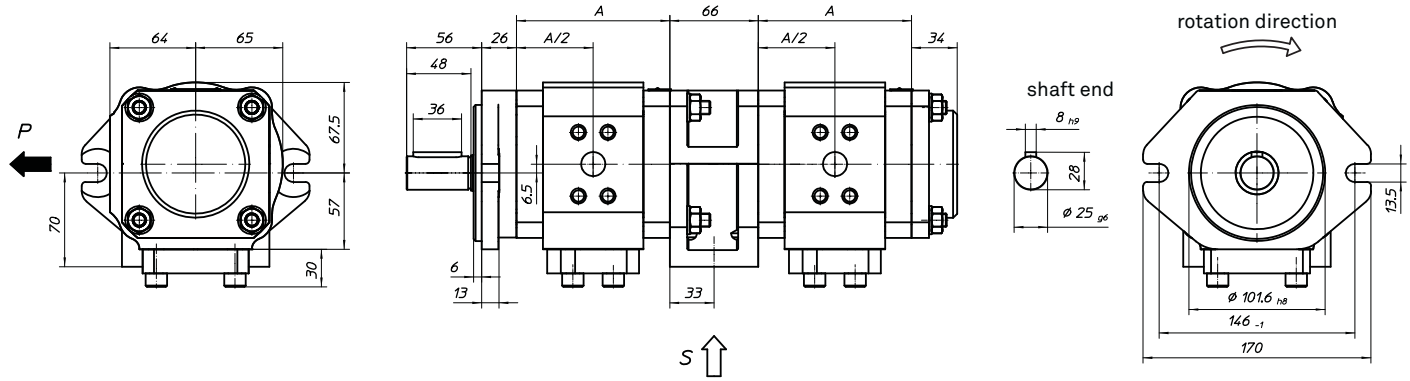
Order example: EIPC3-___RK23-1X



Size	A	B	C	E
020	97,9	47,5	22	18
025	104,4	47,5	22	18
032	114,4	47,5	22	18
040	125,4	52,4	26,2	20
050	139,4	52,4	26,2	20

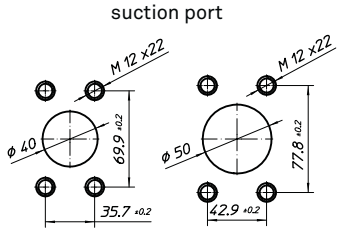
Double pump with SAE-B-2-hole flange and cylindrical shaft

Order example: EIPC3-___RK20-1X+
EIPC3-___RP30-1X



Size	A
020	97,9
025	104,4
032	114,4
040	125,4
050	139,4

suction port



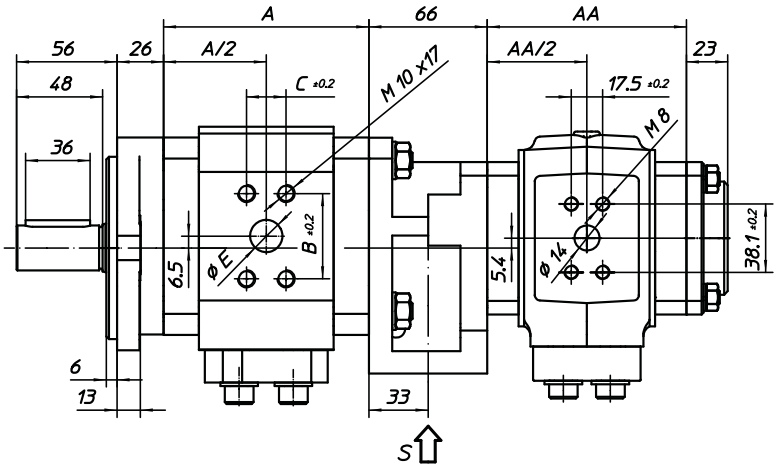
Pressure connections see single pump

size 020-032 size 040-050

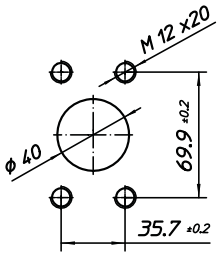
Dimensions

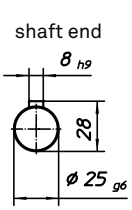
Double pump with SAE-B-2-hole flange and cylindrical shaft

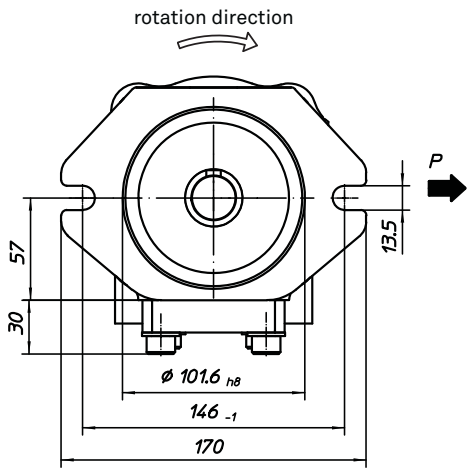
Order example: EIPC3-___RK20-1X+
EIPH2-___RP30-1X

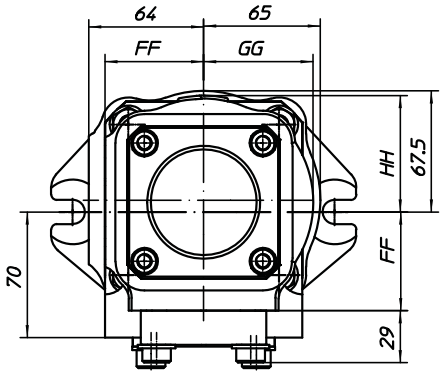


common
suction port









EIPC3

Size	A	B	C	E
020	97,9	47,5	22	18
025	104,4	47,5	22	18
032	114,4	47,5	22	18
040	125,4	52,4	26,2	20
050	139,4	52,4	26,2	20

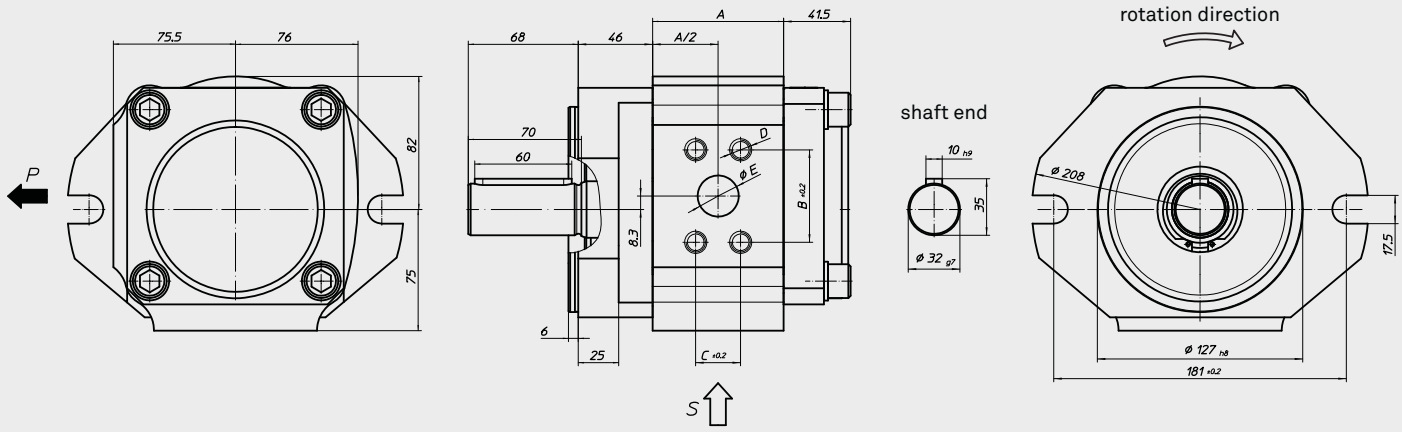
EIPH2

Size	AA	FF	GG	HH
004	71	50	55	59
005	71	50	55	59
006	73	50	55	59
008	76	50	55	59
011	82	50	55	59
013	87	50	55	60
016	92	50	55	60
019	99	55	61	65
022	105	55	61	65
025	111	55	61	65

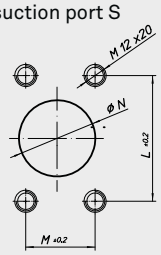
The single pumps of a multiple pump assembly are internally connected, even if you connect to the pump inlet.
It is therefore no operating with different fluids possible.

Pump with SAE-C-2-hole flange and zylindrical shaft

Order example: EIPC5-___RA23-1X



suction port S

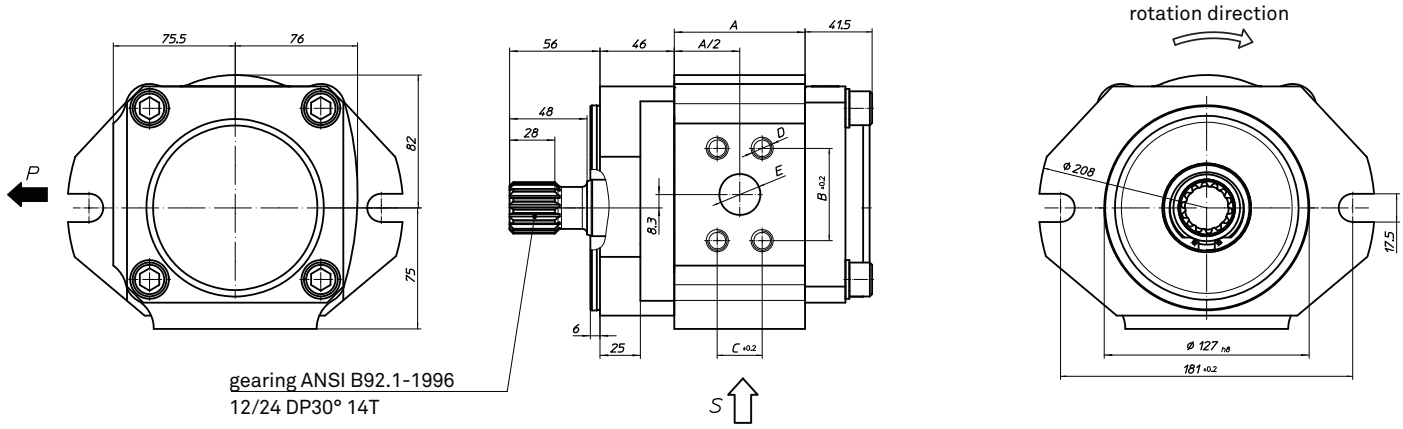


Size	A	B*	C*	D	E	L**	M**	N
064	81	57,2	27,8	M12x22	25,4	77,8	42,9	47,2
080	93	66,7	31,8	M14x24	31,8	77,8	42,9	47,2
100	109	66,7	31,8	M14x24	31,8	88,9	50,8	63,5

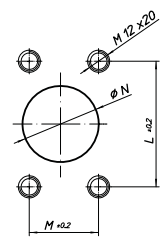
* Pressure port: SAE J518, high pressure series (code 62)
** Suction port: SAE J518, standard pressure series (code 61)

Pump with SAE-C-2-hole flange and spline shaft

Order example: EIPC5-___RB23-1X



suction port

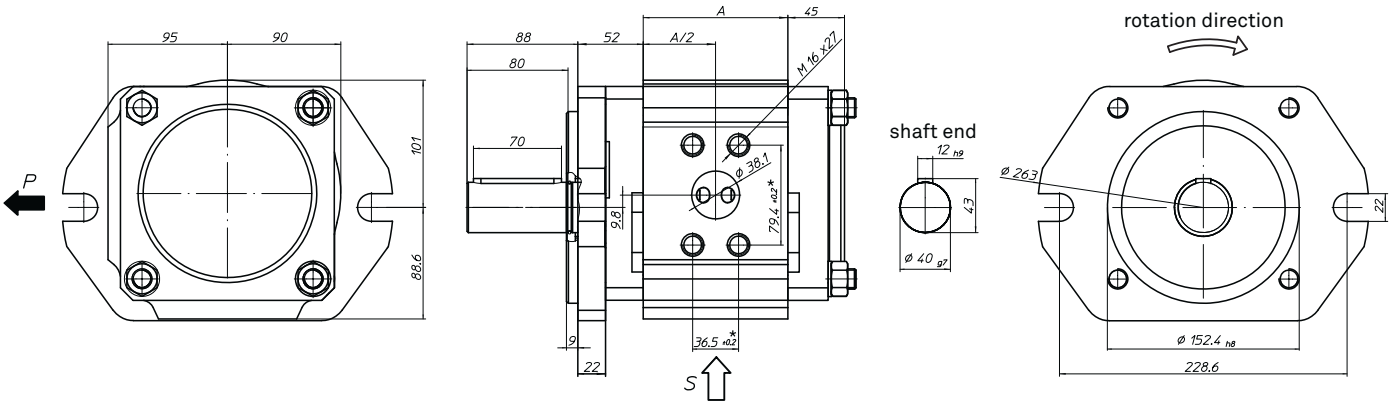


Size	A	B*	C*	D	E	L**	M**	N
064	81	57,2	27,8	M12x22	25,4	77,8	42,9	47,2
080	93	66,7	31,8	M14x24	31,8	77,8	42,9	47,2
100	109	66,7	31,8	M14x24	31,8	88,9	50,8	63,5

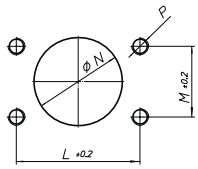
* Pressure port: SAE J518, high pressure series (code 62)
** Suction port: SAE J518, standard pressure series (code 61)

Pump with SAE-D-2-hole flange and zylindrical shaft

Order example: EIPC6-___RA23-1X



suction port

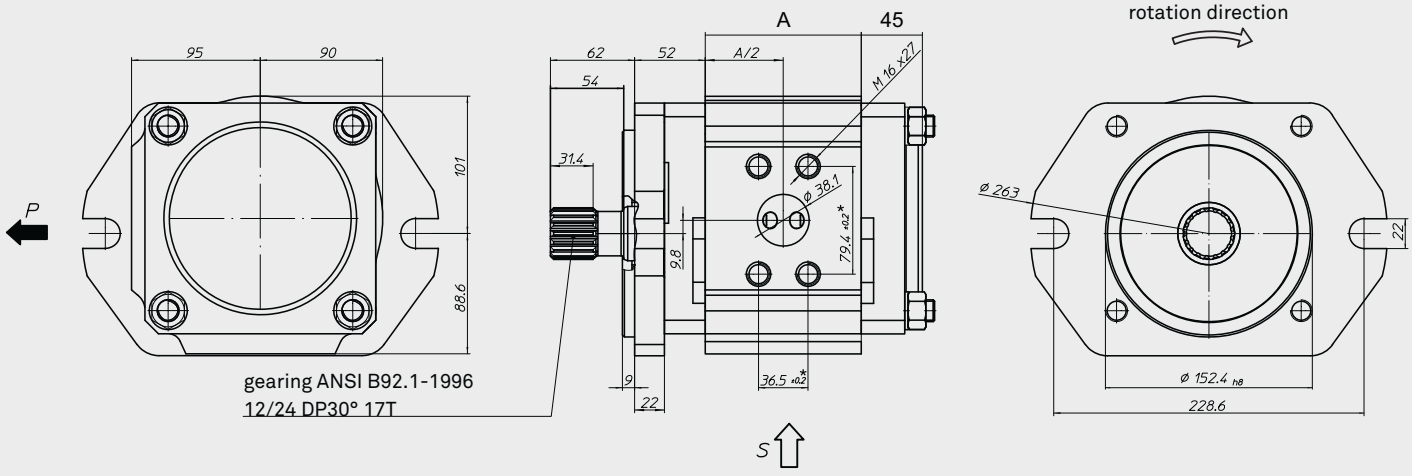


Size	A	L**	M**	N	P
125	115	88,9	50,8	63,5	M12x22
160	136	106,4	61,9	76,2	M16x25
200	161	120,7	69,9	88,9	M16x25
250	191	120,7	69,9	88,9	M16x25

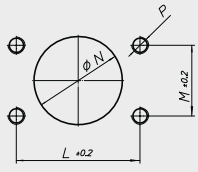
* Pressure port: SAE J518, high pressure series (code 62)
** Suction port: SAE J518, standard pressure series (code 61)

Pump with SAE-D-2-hole flange and spline shaft

Order example: EIPC6-___RB23-1X



suction port



Size	A	L**	M**	N	P
125	115	88,9	50,8	63,5	M12x22
160	136	106,4	61,9	76,2	M16x25
200	161	120,7	69,9	88,9	M16x25
250	191	120,7	69,9	88,9	M16x25

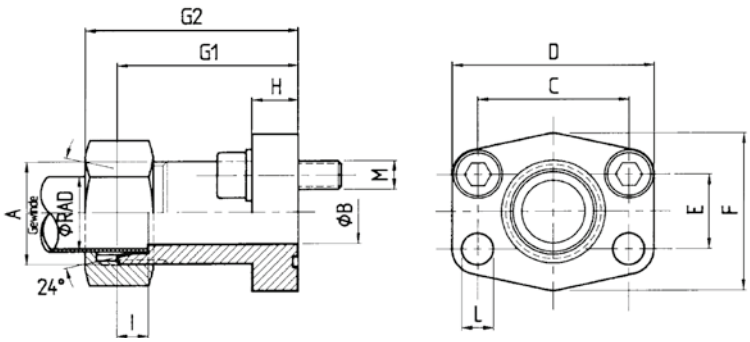
* Pressure port: SAE J518, high pressure series (code 62)
** Suction port: SAE J518, standard pressure series (code 61)

Connecting flanges SAE

EIPC

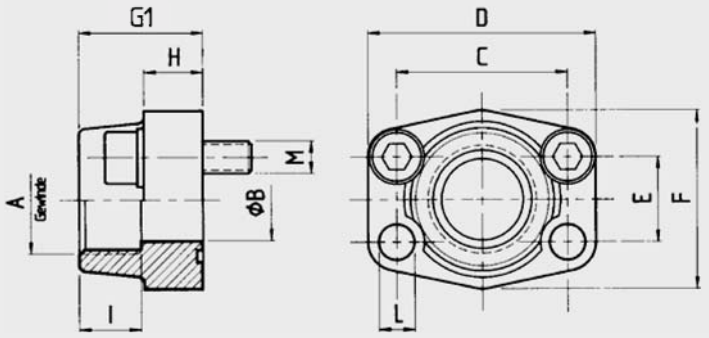
SAE flange metric tapped

Version a



SAE pipe threaded flange

Version b



Nr.	Article number	Type	pmax	AD	A	B	C	D	E	F	G1	G2	H	I	L	M
1a	07 07 04 0030	AD15-SAE12M22x1,5	315	15	M22x1,5	12	38,1	54	17,48	46	52	60	13	7	9	M8x25
1b	07 07 04 0026	EFG1/2-SAE12	350		G1/2"	13	38,1	54	17,48	46	36		19	19	9	M8x30
2a	07 07 04 0031	AD22-SAE34M30x2	160	22	M30x2	19	47,63	65	22,23	50	60	69	14	7,5	11,5	M10x30
2b	07 07 04 0027	EFG3/4-SAE34	350		G3/4"	19	47,63	65	22,23	50	36		18	19	11	M10x35
3a	07 07 04 0032	AD28-SAE100M36x2	160	28	M36x2	24	52,37	70	26,19	55	63	72	16	7,5	11,5	M10x30
3b	07 07 04 0028	EFG1-SAE100	315		G1"	25	52,37	70	26,19	55	38		18	22	11	M10x35
4a	07 07 04 0033	AD35-SAE114M45x2	160	35	M45x2	29	58,72	79	30,18	68	65	76	14	10,5	11,5	M10x30
4b	07 07 04 0029	EFG1 1/4-SAE114	250		G1 1/4"	32	58,72	79	30,18	68	41		21	22	11,5	M10x40
5a	07 07 04 0037	AD42-SAE112M52x2	160	42	M52x2	36	69,85	94	35,71	78	70	82	16	11	13,5	M12x35
5b	07 07 04 0034	EFG1 1/2-SAE112	200		G1 1/2"	38	69,85	94	35,71	78	45		25	24	13,5	M12x45
6b	07 07 04 0036	EFG2-SAE200	200		G2"	51	77,77	102	42,88	90	45		25	30	13,5	M12x45
7b	07 07 04 0041	EFG2 1/2-SAE212	160		G2 1/2"	63	88,9	114	50,8	105	50		25	30	13,5	M12x45
8a	07 07 04 0042	AD30-SAE100M42x2HD	400	30	M42x2	25	57,2	81	27,8	70	82	95	24	13,5	13	M12x45
9a	07 07 04 0043	AF6-404M/S38M	400	38	M52x2	29	66,6	95	31,8	78	92		27	16	15	M14x50
10b	07 07 04 0050	EFG3-SAE300-C	160		G3"	73	106,4	134	61,9	116	50		27	38	17,5	M16x50

Connecting flanges SAE for Double pump EIPC3

Summary of SAE Pressure- and Suction flange SAE J518C, ISO 6162

Type	Inlet	Nr.	Version a	Version b	Outlet	Nr.	Version a	Version b	
EIPC3-020-032	1 1/4"	4	•	•	3/4"	2	•	•	
EIPC3-040-064	1 1/4"	4	•	•	1"	3	•	•	1)
EIPC3-040-064	2"	6		•	1"	3	•	•	2)
EIPC5-064	2"	6		•	1"*	8	•		
EIPC5-080	2"	6		•	1 1/4"*	9	•		
EIPC5-100	2 1/2"	7		•	1 1/4"*	9	•		
EIPC6-125	2 1/2"	7		•	1 1/2"*		○	○	
EIPC6-160	3"	10		•	1 1/2"*		○	○	
EIPC6-200	3 1/2"		○	○	1 1/2"*		○	○	
EIPC6-250	3 1/2"		○	○	1 1/2"*		○	○	

* High pressure range
1) EIPC3-063 not available with 1 1/4" suction flange
2) Pumps with enlarged suction ports

Suction flange for Intermediate housing

Type	Inlet	Nr.	Version a	Version b
EIPC3/3 till size 032	1 1/2"	5	•	•
EIPC3/3 from size 040	2"	6		•

• = available ○ = on request

Notes

Ordering Code

EIP C3 - 016 RK23 - 1X SXXX

Special version number
(not applicable with standard pumps or when the type key is unambiguous)

Revision code
1st number: Change of mounting dimensions
2nd number: Change of pump with same mounting dimensions

Intake and outlet connection
3: According to SAE J 518
6: According to SAE J 518 for enlarged suction port for speed controlled drive applications
0: suction port closed; common inlet
– other flanges on request –

Fastening flange
2: SAE/B 2-hole flange, centring collar Ø 101,6 / at EIPC3
2: SAE/C 2-hole flange, centring collar Ø 127 / at EIPC5
2: SAE/D 2-hole flange, centring collar Ø 152,4 / at EIPC6
3: Direct fixture
5: VDMA on request
– other flanges on request –

Shaft end
A: Cylindrical
K: Cylindrical with spigot
B: SAE gear
L: SAE gear with spigot
P: Spigot tooth system on both sides
(Spigot = add-on facility for additional pumps to create multiple-flow pumps)

Rotation direction
R: Clockwise (S: CW size 5/3 | T: CW size 5/2)
L: Anticlockwise

Rated size
Three digits

Overall size
3, 5 or 6

Type
C: Industrial pump with aluminium housing

Eckerle internal gear pump

Order example

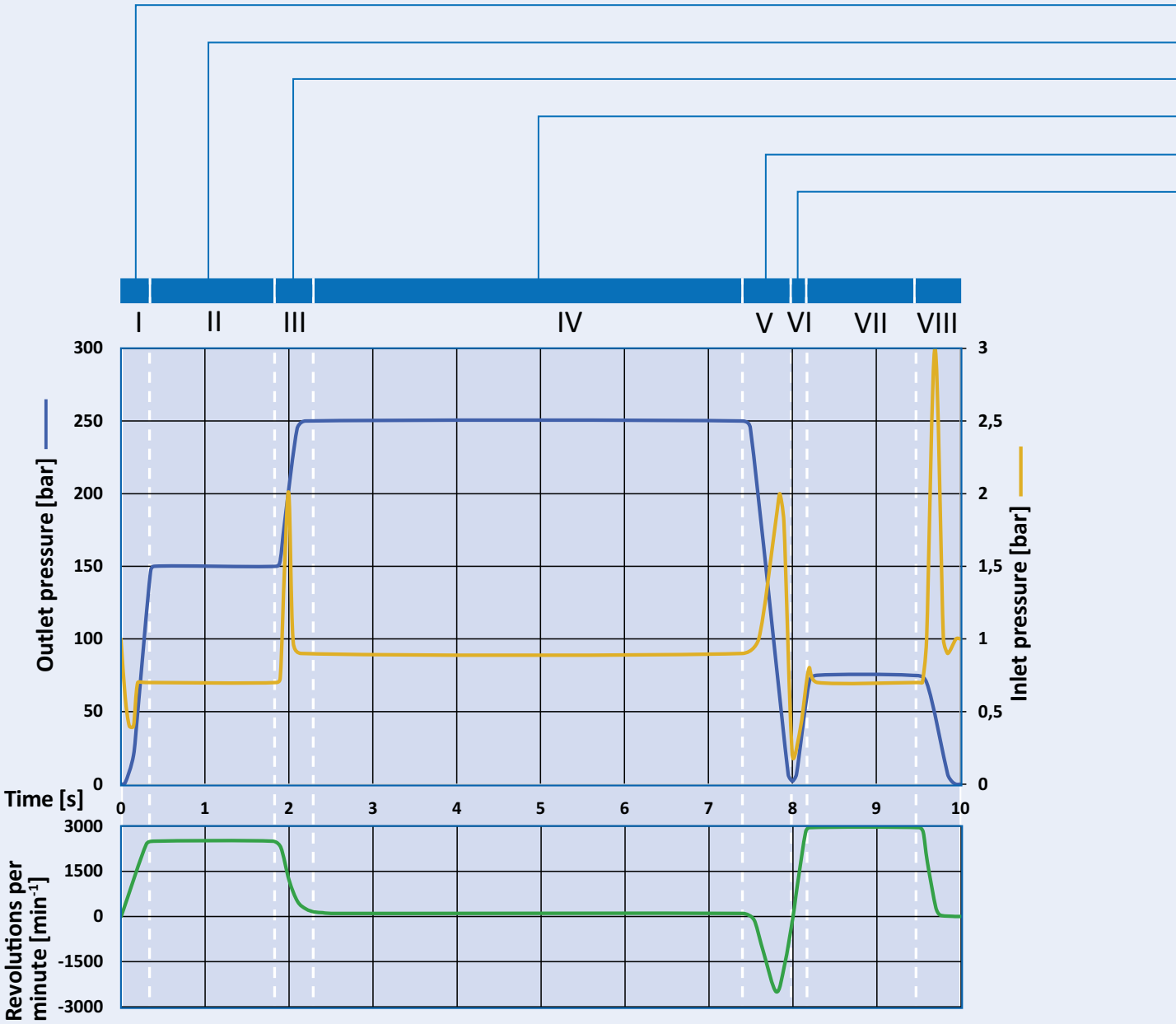
EIPC3-032 RK23-1X

for industrial applications
overall size 3 with 32.1 cm^3/U
clockwise rotation
cylindrical shaft with cone
SAE/B-2-hole flange
SAE flange connection
revision code 1X

Variable-speed operation

As a matter of principle, Eckerle internal gear pumps are eminently suited for variable speed operation. Even at low viscosities and high temperatures of the pumping medium, the pumps run extremely energy efficiently and highly dynamically over a wide speed range due to the radial and axial gap compensation.

However, with variable speed operation certain boundary conditions should be observed. The exemplary cycle shown below illustrates this clearly.



I. Start:

Eckerle internal gear pumps are able to build up pressure from standstill. This happens smoothly when the pump starts from an unpressurized state. Please talk to Eckerle, if due to the system design the pump is pressurized at standstill.

II. + VII. Pump operation:

Eckerle internal gear pumps are capable of providing a speed-dependent volumetric flow at any pressure level during pump operation. However, application limits of the respective sizes must be observed. [2)]

III. + VIII. Deceleration:

With Eckerle internal gear pumps very high decelerations can be achieved. It must be ensured though that line-dependent pressure peaks can develop within the suction side. These should not exceed the maximum permissible inlet pressure. [2) 3)]

IV. Pressure Holding Operation:

Eckerle internal gear pumps are able to build up high pressures even at very low speeds due to the gap compensation. Hold pressure operation is thus extremely energy-efficient. Pump operation should follow after the hold pressure operation to flush out the pump.

V. Reverse operation:

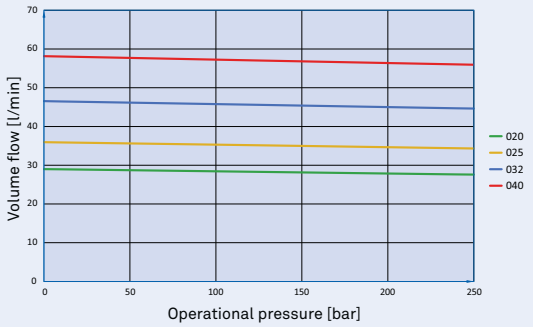
Eckerle internal gear pumps are usually able to run highly dynamically in the opposite direction of rotation in order to lower pressure peaks, or by means of a hydraulic motor. However, it must be ensured that the output pressure is always higher than the input pressure. [1) 3)]

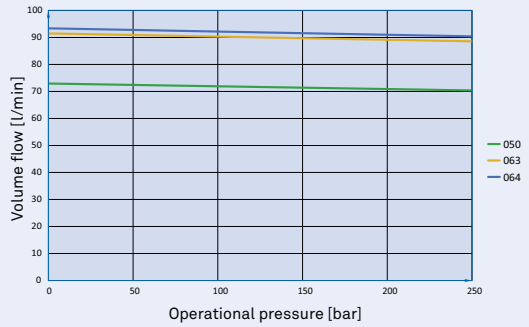
VI. Acceleration:

With Eckerle internal gear pumps very large speed-ups can be run. These are limited by inlet pressure, geometry of the suction line and viscosity. However, these may not drop below the specified minimum inlet pressure of the series. [1) 3)]

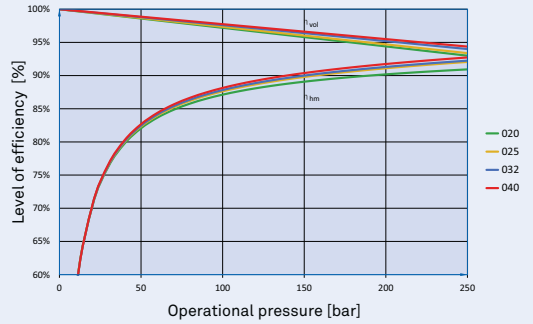
1) See Characteristics
2) See Technical data
3) To avoid critical operating points, we recommend taking measurements of the pump's inlet and outlet pressure near the pump with a scanning rate of at least 1 kHz when a new pump cycle starts.

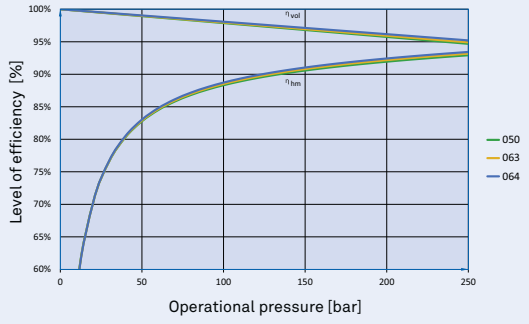
Volume flow



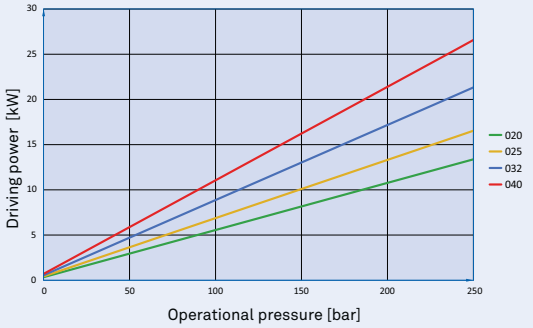


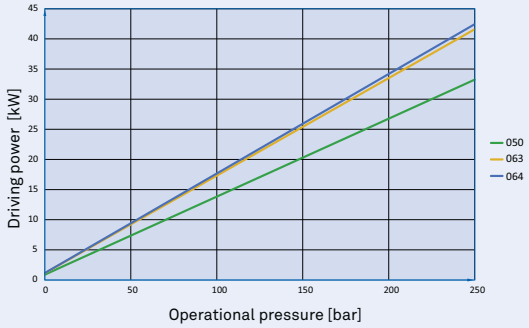
Level of efficiency



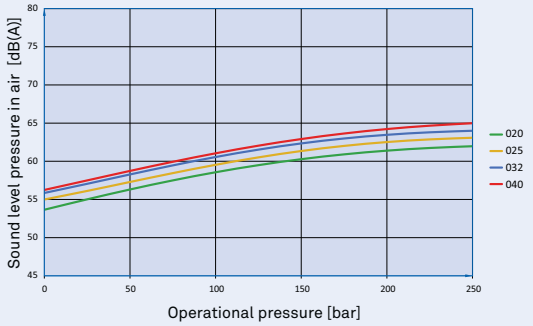


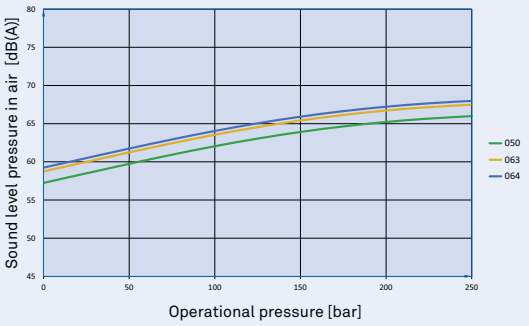
Driving power





Sound level pressure in air

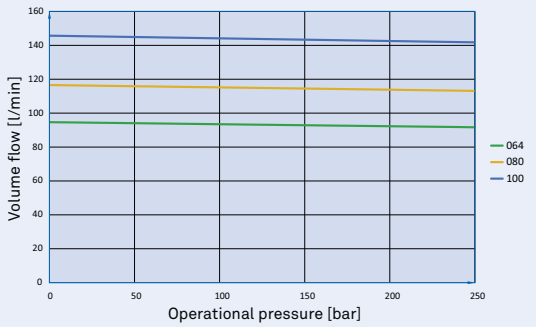




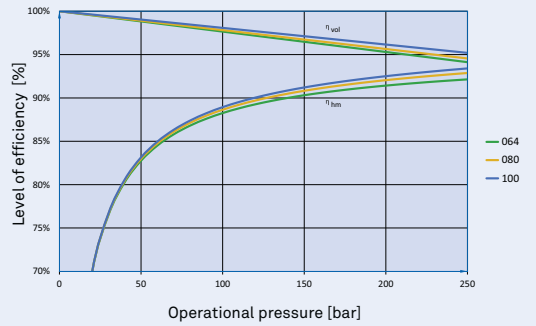
Measurement conditions: Speed 1450 rpm, viscosity 46 mm²/sec., operating temperature 40 °C, Sound pressure measured in low-reflection anechoic room in accordance with DIN 45 635 sheet 26; Microphone distance 1.0 m axial.

EIPC5

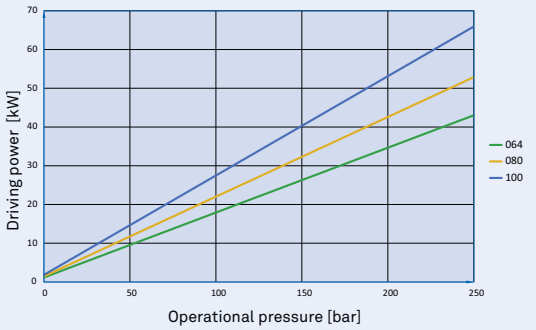
Volume flow



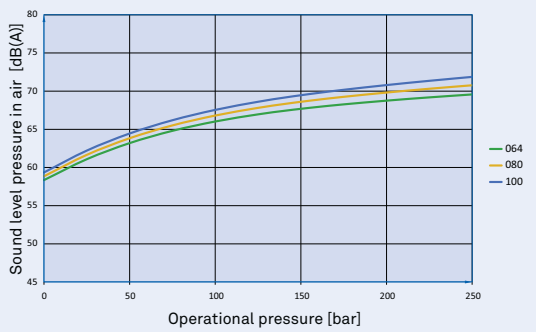
Level of efficiency



Driving power

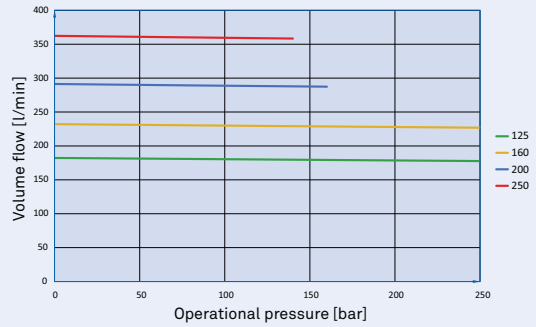


Sound level pressure in air

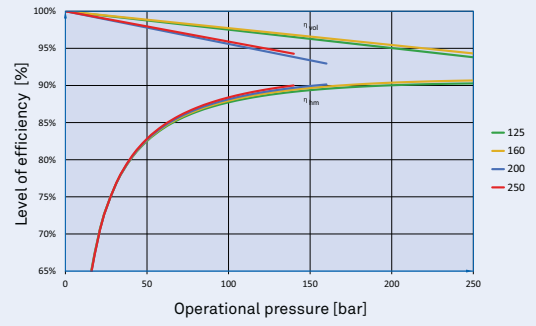


EIPC6

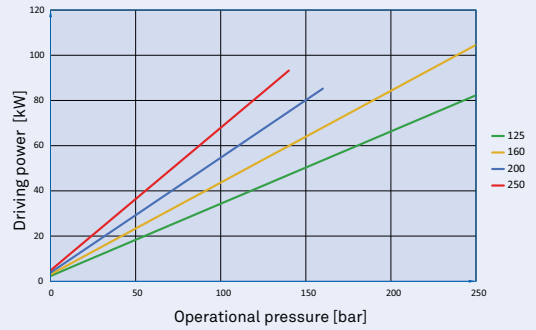
Volume flow



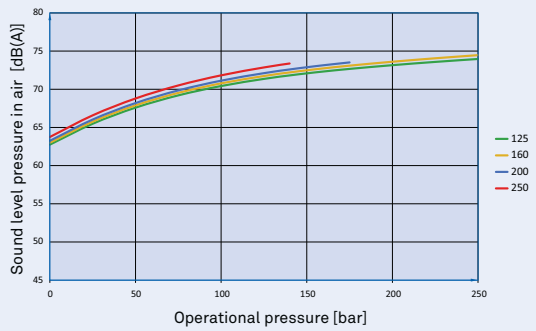
Level of efficiency



Driving power



Sound level pressure in air

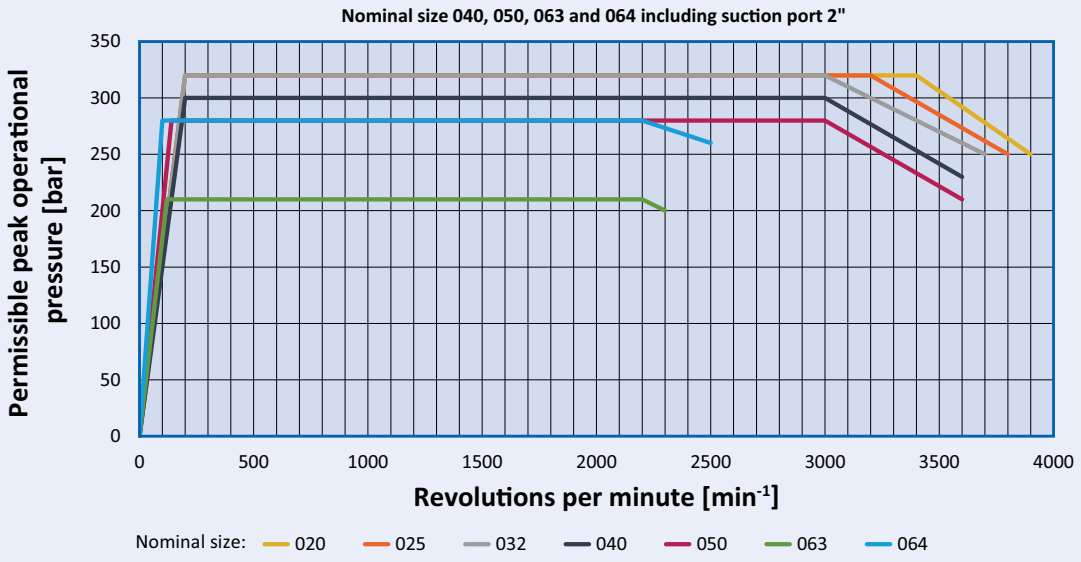


Measurement conditions: Speed 1450 rpm, viscosity 46 mm²/sec., operating temperature 40 °C, Sound pressure measured in low-reflection anechoic room in accordance with DIN 45 635 sheet 26; Microphone distance 1.0 m axial.

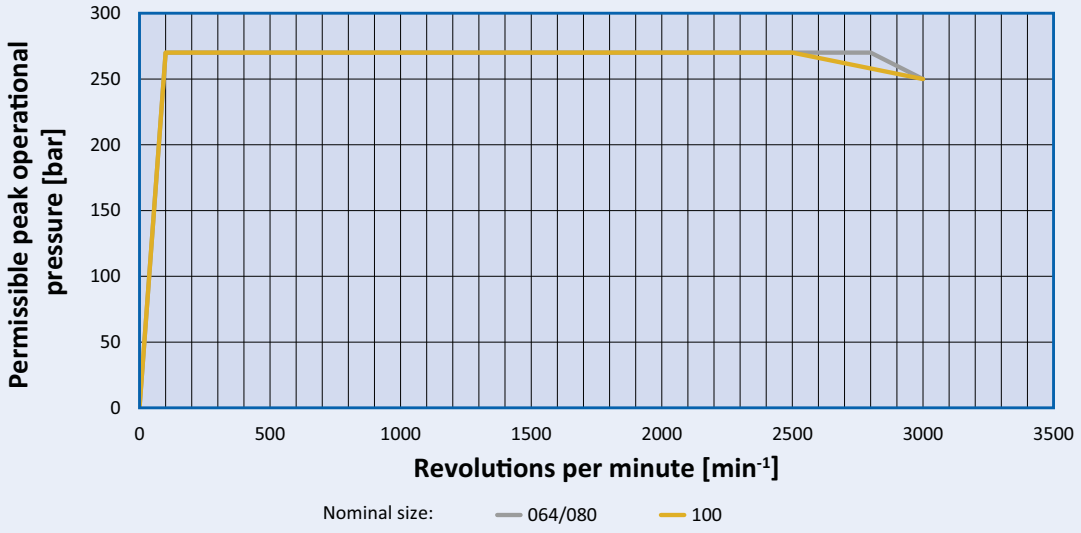
Characteristics

Permissable peak operational pressure dependent on speed

EIPC3

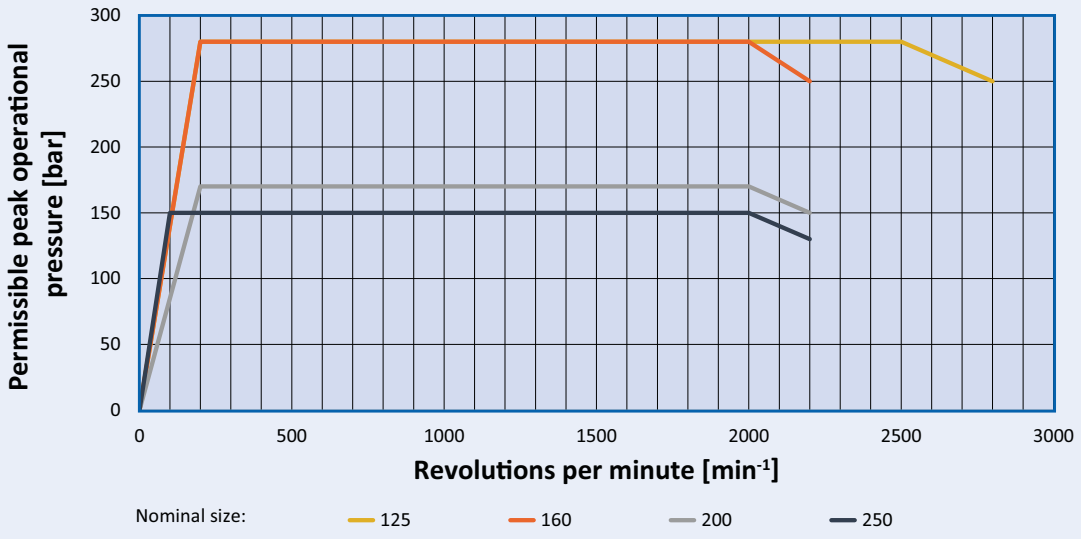


EIPC5



Peak operating pressures are permitted for a maximum of 10 seconds or 15% of the duty cycle

EIPC6


Permissible peak operational pressure [bar]
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
3000
Revolutions per minute [min-1]
Nominal size:
125
160
200
250

For further information please visit:
eckerle.com

All indicated data serve alone the product description and are not as characteristics in the legal sense to be understood. Subject to alterations.

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ATP HYDRAULIK

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