



WARYŃSKI HYDRAULIKA PRODUCER OF GEAR PUMPS AND MOTORS DIRECTIONAL CONTROL VALVES

- **HISTORY**
 - **COMPANY PROFILE**
 - **PRODUCT OVERVIEW**
 - **APPLICATION**
 - **CONTACT**
-

WARYŃSKI-HYDRAULIKA is a continuator of activity in range of production and sales of hydraulic units based on Hamworthy Hydraulics LTD licence agreement. Our company has been active on European markets for over 35 years.

1970

purchase of Hamworthy Hydraulics Ltd licence. (Great Britain)

1970 -1991

close and long term co-operation with Hamworthy Hydraulics Ltd.

1973

beginning of production of gear units, directional control valves and valves based on HHL licence.

1973 -1992

production and activity under manufacturer of excavators Waryński

1992

establishing Waryński Hydraulika company as a part of Bumar Waryński S.A Holding Group.

1995

agreement with German company  about service co-operation on piston pumps and other products.

1992 - 2xxx

production and activity under Waryński Hydraulika Sp. z o. o.

Long lasting experience and professional service rendered to our customers is an unquestionable evidence that we are main manufacturer of gear pumps and motors in Eastern Europe.

Warynski-Hydraulika offers:

- - Hamworthy series gear pumps and motors
- - Hamworthy series directional control valves
- - Hamworthy series valves to control pressure, flow, direction
- - Waryński series gear pumps

WE ALSO OFFER

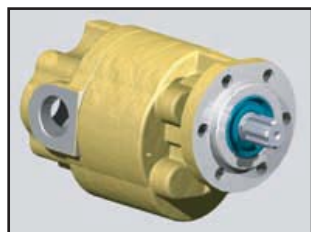
- - sale and service of piston pumps and motors as well *Linde* units.
- - sale of building machines parts and hydraulic system components
- - repair of hydraulic units
- - research and diagnostic of pumps, motors, control valves on a large power test station (up to 250 kW)
- - technical advice

PRODUCT OVERVIEW

SERIE HAMWORTHY

ALL UNITS ARE BASED ON HAMWORTHY HYDRAULICS LTD. (GB) LICENCE

GEAR PUMPS AND MOTORS



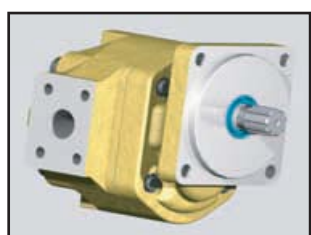
1600



2100



3100



1900/2200/2400

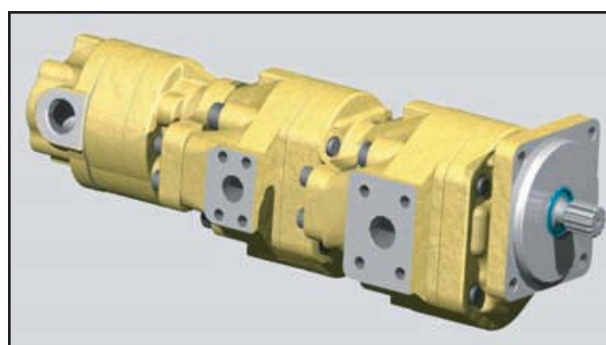
- - as single or multiple units
- - mounted in high grade Cast Iron
- - working as external gear set
- - running on heavy duty roller or hydrodynamic bush bearings
- - with pressure compensation wearplates
- - in performance clock, anticlock or bi-rotation.

There are options of seal design, shafts, flanges, ports in SAE standards.
All units are tested after assembly to confirm the high quality.

Displacement range	12,4-306 ccm/rev
Rated pressure	up to 21 MPa
Max speed	2700rpm (pumps) 3000rpm (motors)
Max torque	31-560Nm (motors)



common inlet



multiple unit

PRODUCT OVERVIEW

SERIE HAMWORTHY

ALL UNITS ARE BASED ON HAMWORTHY HYDRAULICS LTD. (GB) LICENCE

DIRECTIONAL CONTROL VALVES

AVAILABLE:

- - in open centre system as tandem, parallel, mixed circuit
- - in monoblock Cast Iron design
- - with different action of spools:
 - D- double action
 - F- float
 - N- motor
 - V- make up
- - with relief valve on inlet side or without
- - with possibility of manual or pilot hydraulic
- - with mechanical detents and hydraulics release
- - high pressure carryover
- - with overload and anticavitation valves

All units are tested after assembly to confirm the high quality.

Flow range

63-450 dm³/min

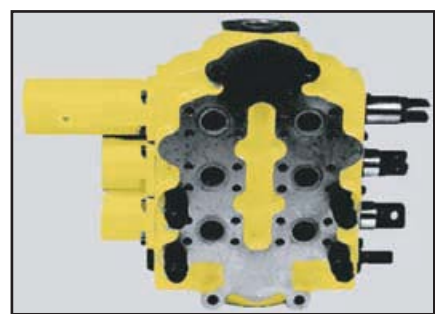
Rated pressure

up to 25 MPa.



1106

4 spools



1013

3 spools

PRODUCT OVERVIEW

WARYŃSKI SERIES



PTO

GEAR PUMPS UP TO 25 MPa

BASED ON OWN DESIGN

- - as single or multiple units
- - mounted in high grade Cast Iron
- - working as external gear set
- - running on hydrodynamic bush bearing
- - with pressure compensation wearplates
- - in performance clock or anticlock rotation

There are options of seal design, shafts, flanges, ports in SAE, German and European standards.

All units are tested after assembly to confirm the high quality.

Displacement range

15-200 ccm/rev

Rated pressure

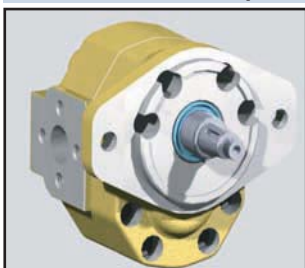
up to 25 MPa

Max speed

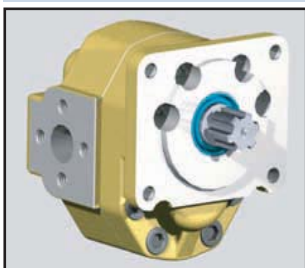
2700 rpm



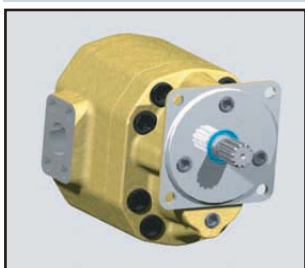
Group 3



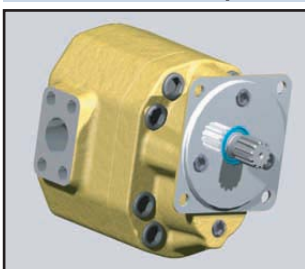
Group 3 (SAE)



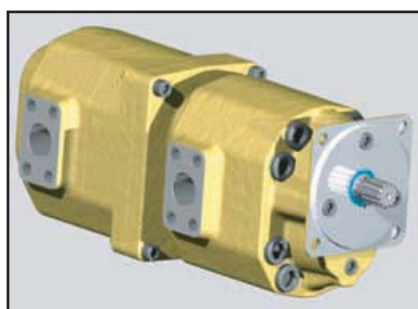
NSZ



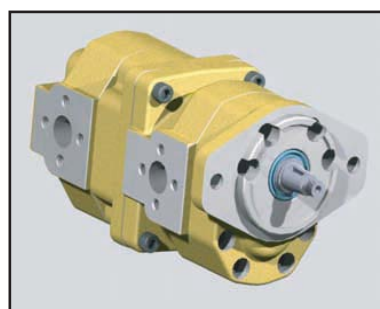
Group 32



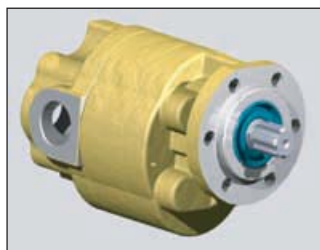
Group 40



Multiple



Multiple

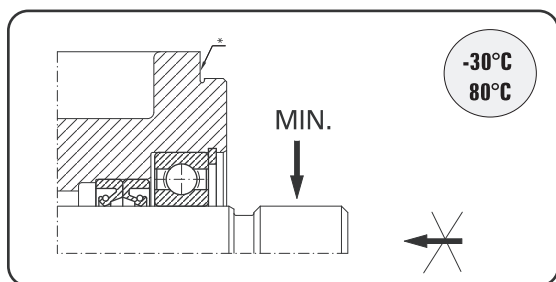


Model	1604	1606	1608	1610	1613	1617
Displacement [ccm/rev]	12,4	14,6	19,4	24,3	31,6	41,3
Rated pressure [MPa]	17	17	17	17	15,5	15,5
Max speed [rpm]	pumps 2700 motors 3000					
Max torque motors [Nm]	31	36	48	60	72	84

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

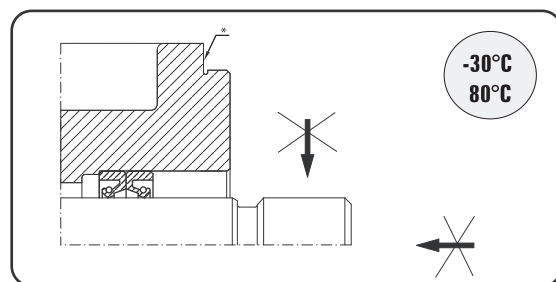
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P	2	C		1604	B	8	C23	C
P M	2	A B C E A2P A2PV C2P C2PV	roller	1604 1606 1608 1610 1613 1617	A B V AD F	1 2 3 5 8	C21/E21 C23/E23 C5/E5 C9/E9 L 32	A C D



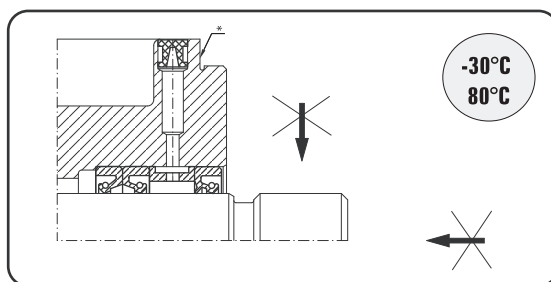
code A

Suitable for drives with limited radial load



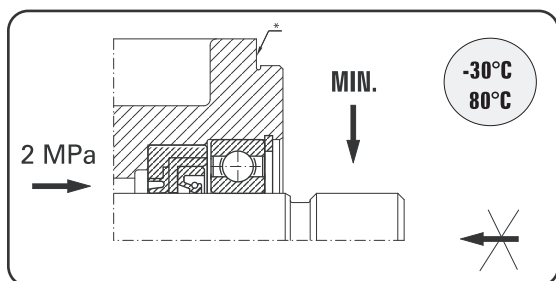
code B

Suitable for drives with no load



code C

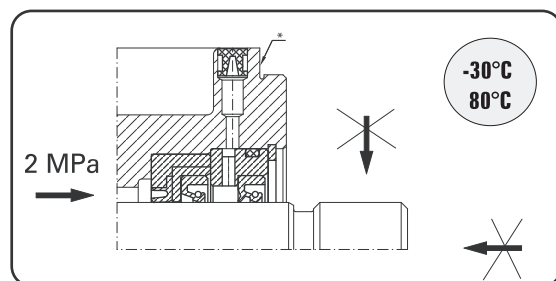
Visible-bleed drilling suitable for drives with no load for direct mounting on torque



code A2P, A2PV

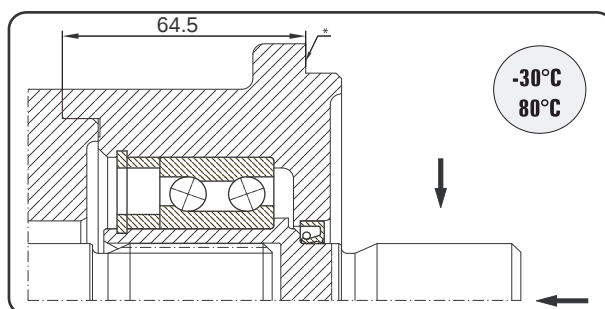
Options of high pressure shaft seal suitable for drives with limited radial load

2P-bi-rotation no check valves with external drain.
2PV-bi-rotation with check valves.



code C2P, C2PV

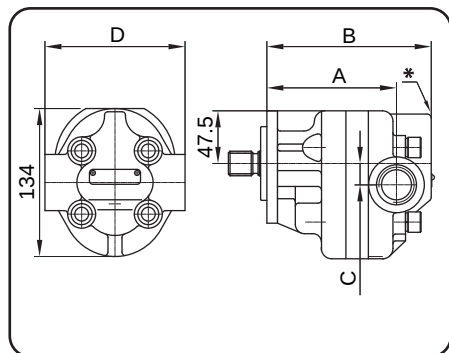
Options of high pressure shaft seal suitable for drives with no load visible-bleed drilling



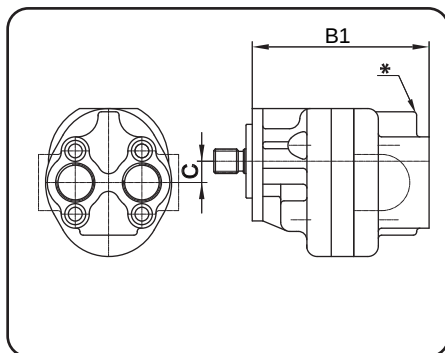
code E

Suitable for drives with heavy axial load and some radial on to drive shaft

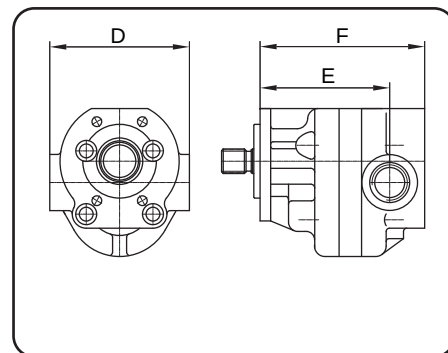
* standard flange mounting surface



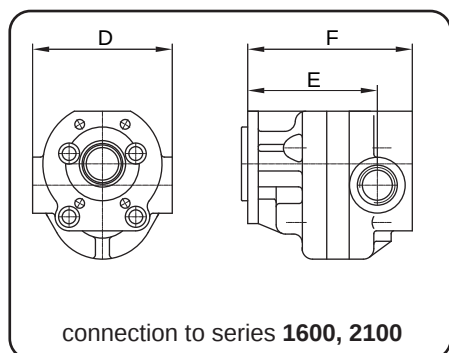
Single unit (side ports)



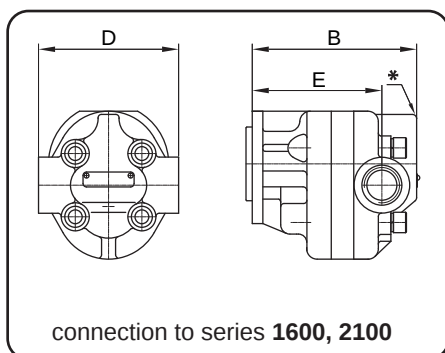
Single unit (end ports)



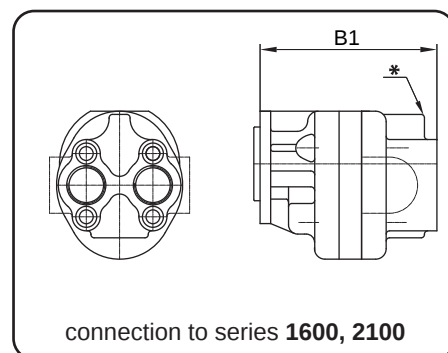
Front unit



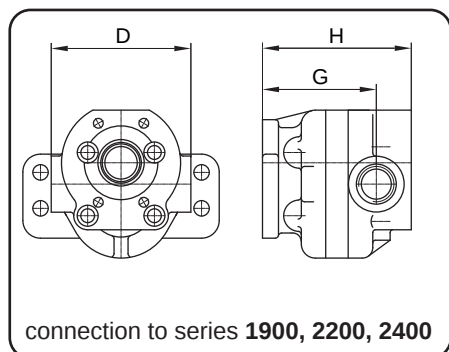
Intermediate unit



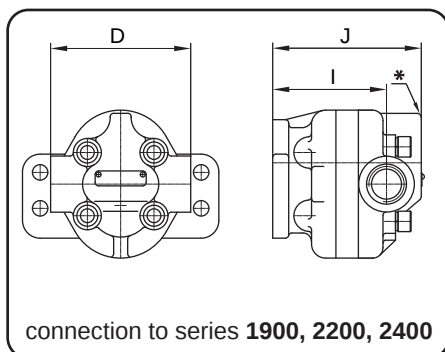
Rear unit (side ports)



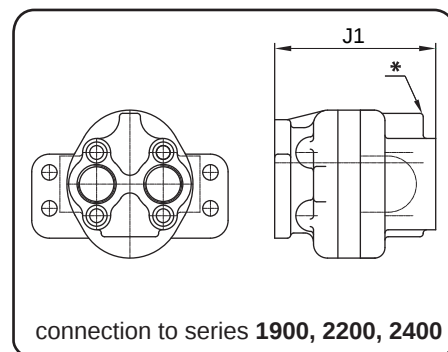
Rear unit (end ports)



Intermediate unit



Rear unit (side ports)

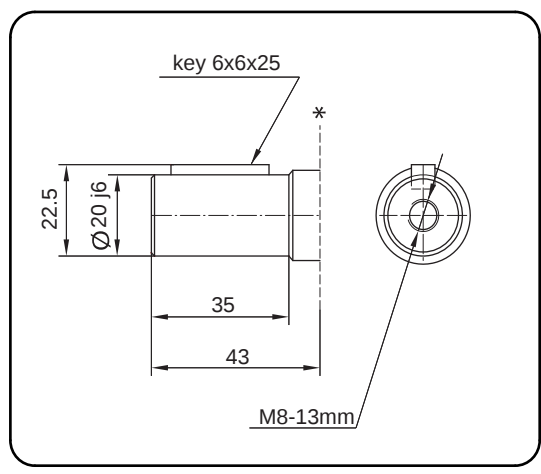


Rear unit (end ports)

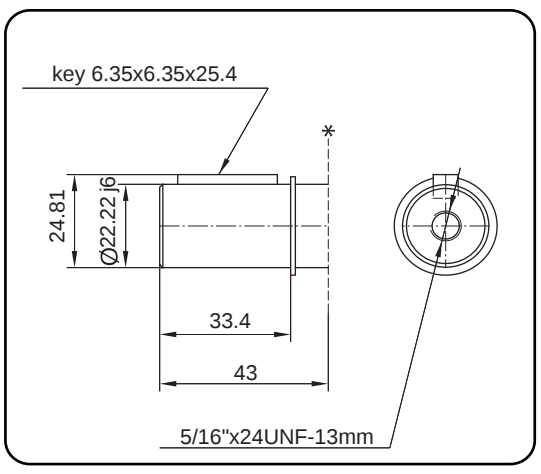
SIZE	A	B	B1	C	WEIGHT [kg]	E	F	WEIGHT [kg]	G	H	WEIGHT [kg]	I	J	J1	WEIGHT [kg]	D
1604	112	144	155	19,3	7	112	144	7	98	130	7	98	130	141	7	127
1606	112	144	155	19,3	7	112	144	7	98	130	7	98	130	141	7	127
1608	117	149	160	19,3	8	117	149	8	103	135	8	103	135	146	8	127
1610	122	154	165	19,3	8	122	154	8	108	140	8	108	140	151	8	127
1613	130	162	173	19,3	9	130	162	9	116	148	9	116	148	159	9	127
1617	140	172	183	19,3	9	140	172	9	126	158	9	126	158	169	9	127

* drain port for motors

SHAFTS WITH KEY

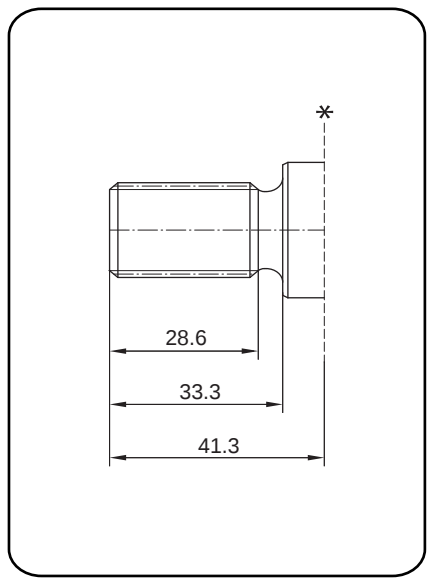


code AD

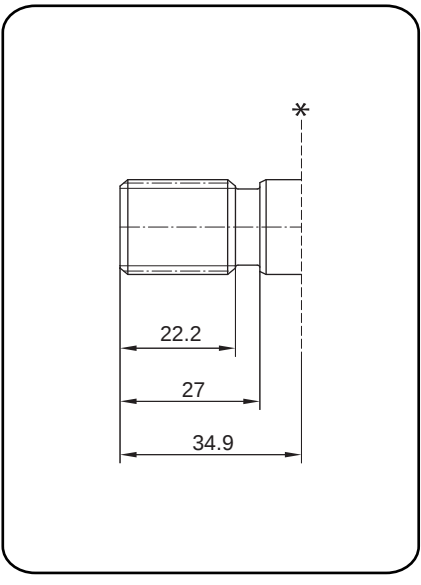


code F

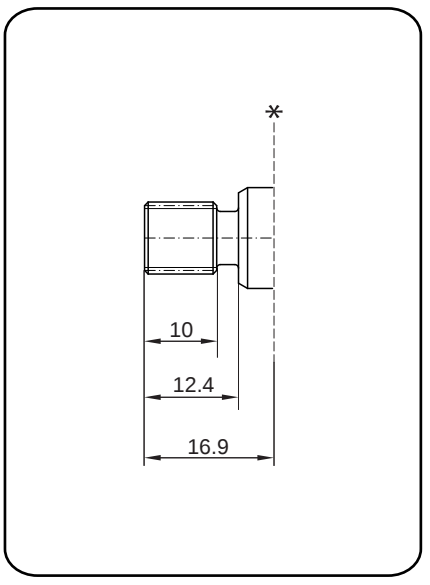
INVOLUTE SPLINE SHAFTS



code B



code V

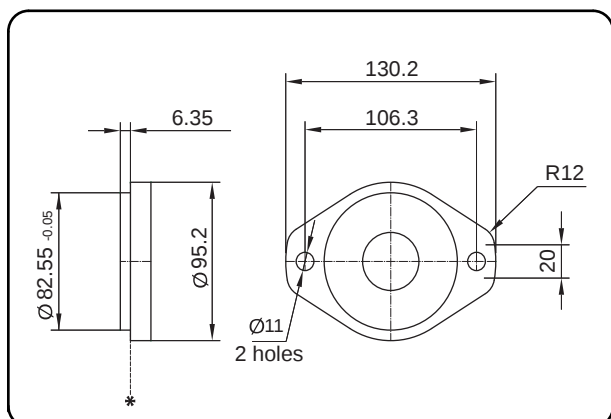


code A

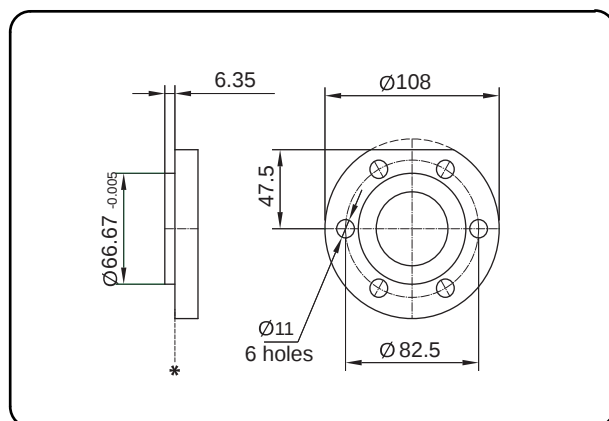
* standard flange mounting surface

	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code B,V	SAE B	flat root	16/32	30 °	13	21,79/ 21,66
	7/8"					
code A	SAE A	flat root	16/32	30 °	9	15,44/ 15,30
	5/8"					

SAE A

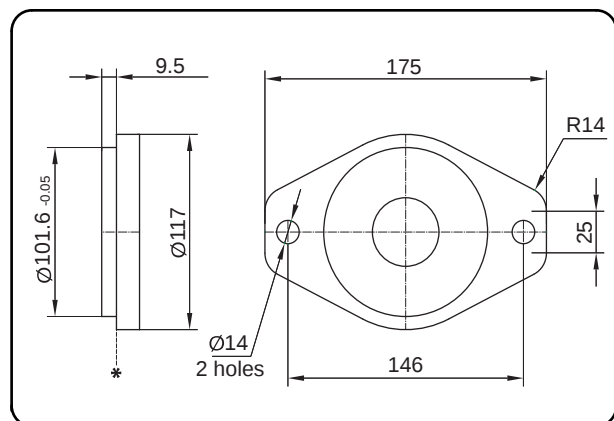


code 1

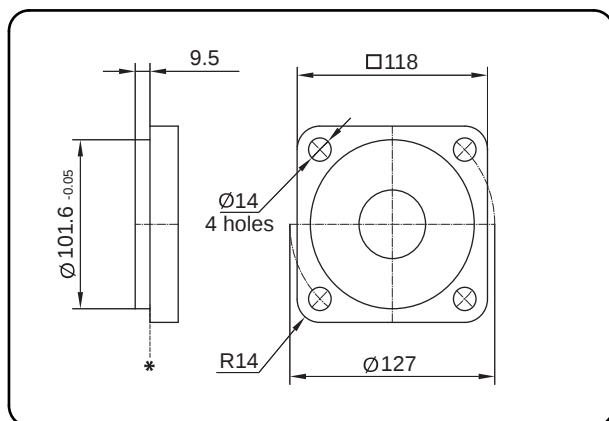


code 8

SAE B

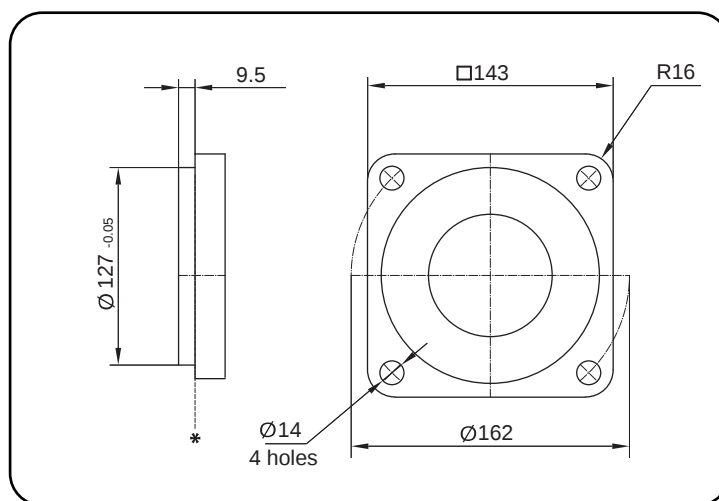


code 2



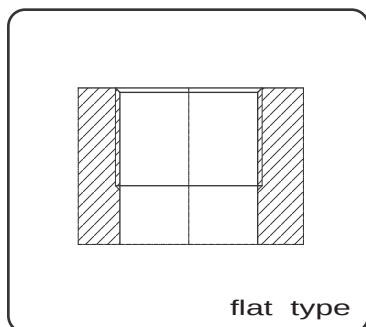
code 3

SAE C



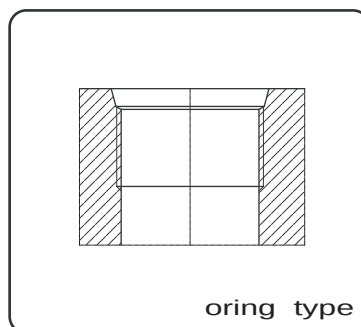
code 5

* standard flange mounting surface



flat type

C5, C21, E5, E21



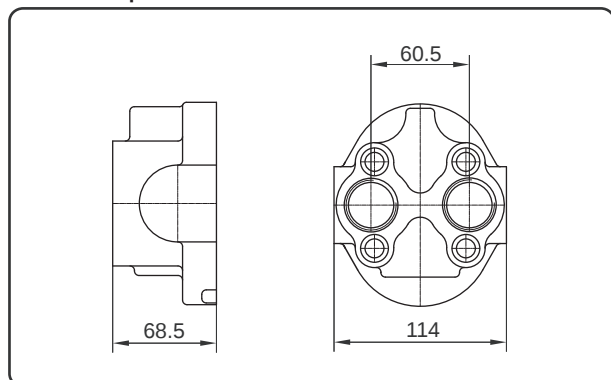
oring type

C9, C23, E9, E23

side ports	inlet	outlet	end ports
C5	1"B.S.P.P	1"B.S.P.P	E5
C9	$15/16$ UNF-SAE oring	$15/16$ UNF-SAE oring	E9
C21	M33x1.5	M33x1.5	E21
C23	M33x2 oring	M33x2 oring	E23

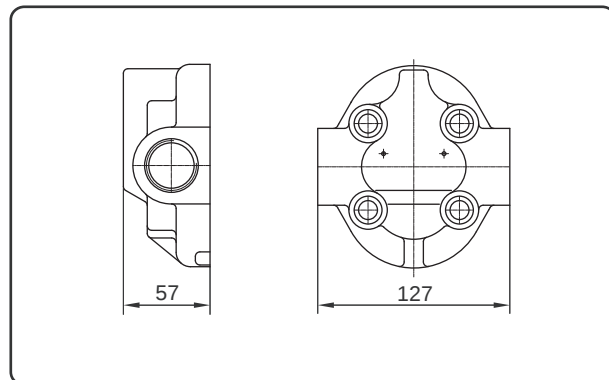
side ports	L32
inlet	1"B.S.P.P oring
outlet	1"B.S.P.P oring

Rear ports



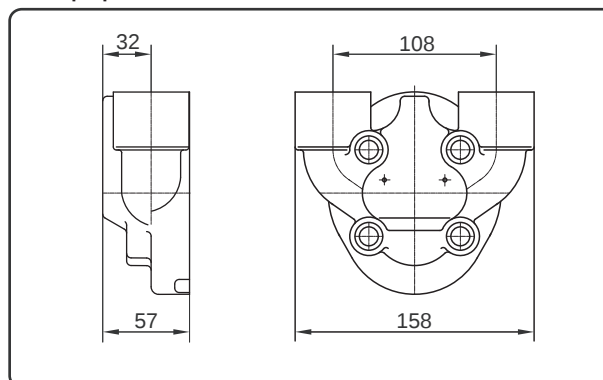
E5, E9, E21, E23

Side ports

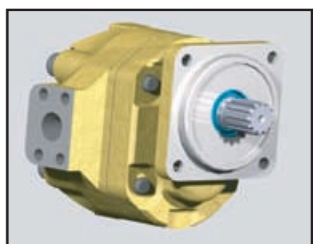


C5, C9, C21, C23

Top ports



L32

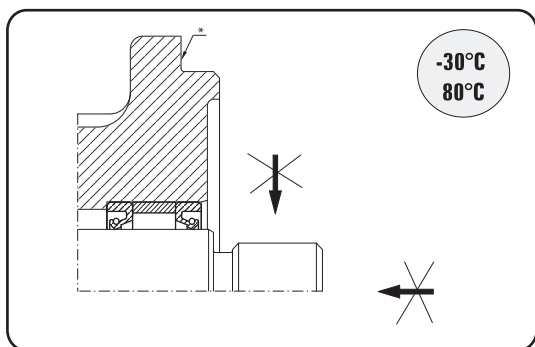


Model	1905	1907	1909	1911	1913
Displacement [ccm/rev]	22,0	33,4	41,5	51,8	62,1
Rated pressure [MPa]	21	21	21	21	21
Max speed [rpm]	pumps 2700 motors 3000				
Max torque motors [Nm]	–	100	122	154	184

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

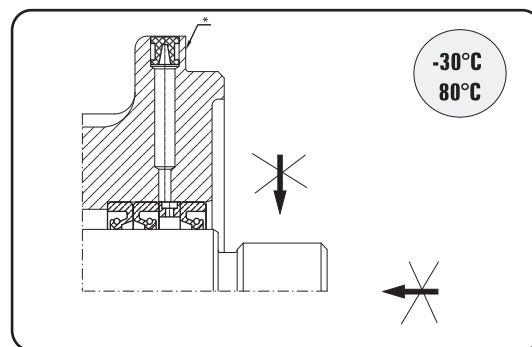
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P		C	P	1905	Q	2	C25	C
P M		A C E A2P A2PV C2P C2PV	roller - plain	1905 1907 1909 1911 1913	B Q R AP	1 2 3 4 5 8	B25 B26	A C D



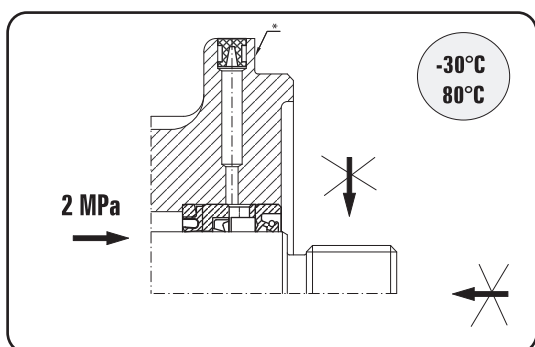
code A

Suitable for external drives and flexible coupling



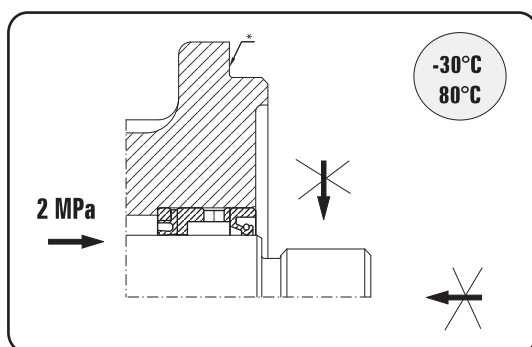
code C

Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes



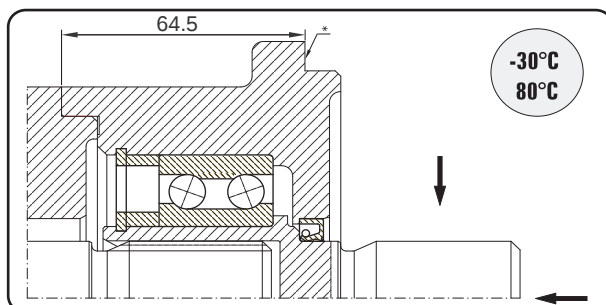
code C2P, C2PV

Options of high pressure shaft seal



code A2P, A2PV

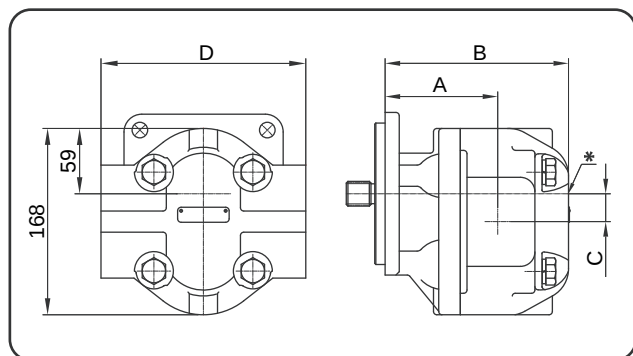
Options of high pressure shaft seal



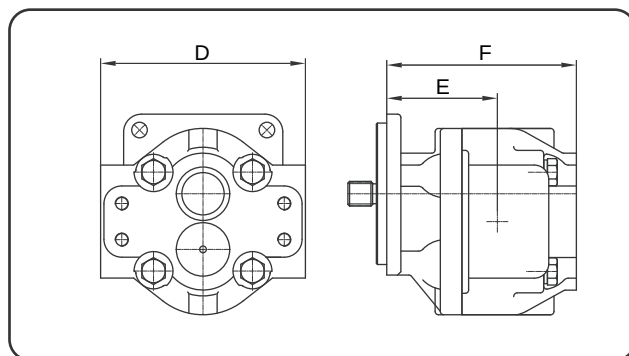
code E

Suitable for drives with heavy axial load and some radial on to drive shaft

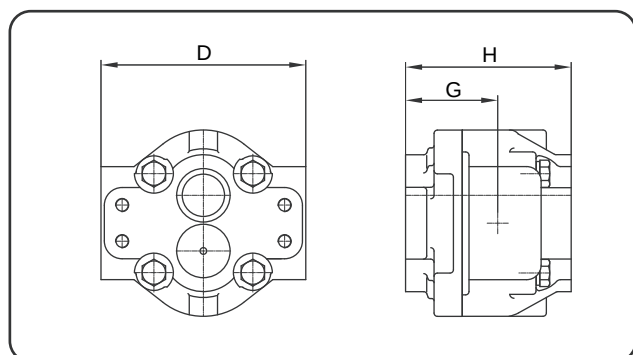
* standard flange mounting surface



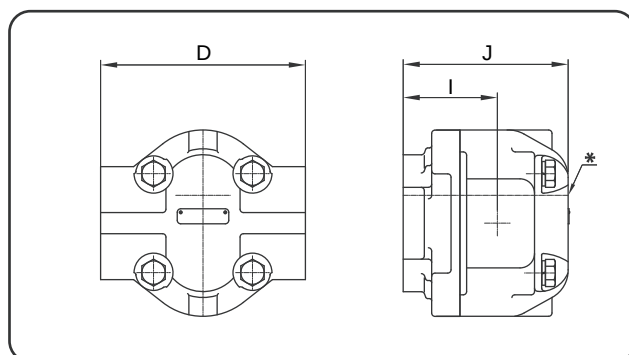
Single unit



Front unit



Intermediate unit

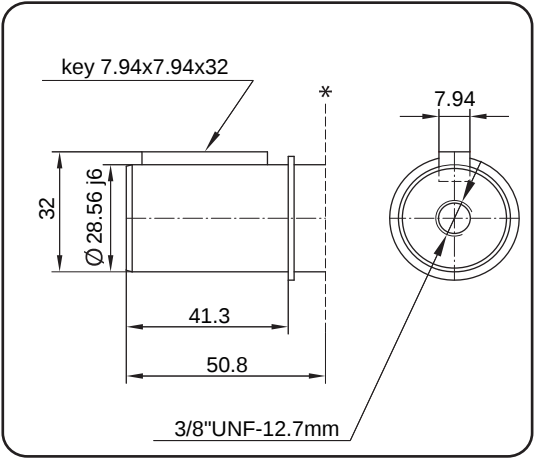


Rear unit

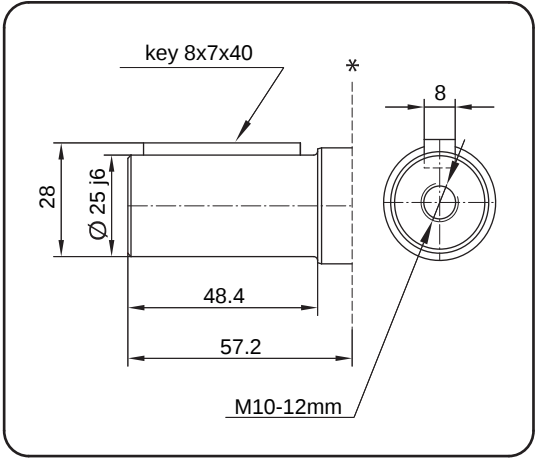
	Single unit				Front unit			Intermediate unit			Rear unit			
SIZE	A	B	C	Weight [kg]	E	F	Weight [kg]	G	H	Weight [kg]	I	J	Weight [kg]	D*
1905	94	143	25	18	94	156	19	83	145	18	83	132	17	184
1907	94	143	25	18	94	162	19	83	151	19	83	132	17	184
1909	97	159	25	18	97	167	19	86	156	19	86	148	18	184
1911	102	159	25	18	102	167	19	91	156	19	91	148	18	184
1913	102	172	25	19	102	179	20	91	169	19	91	161	19	184

* drain port for motors

SHAFTS WITH KEY

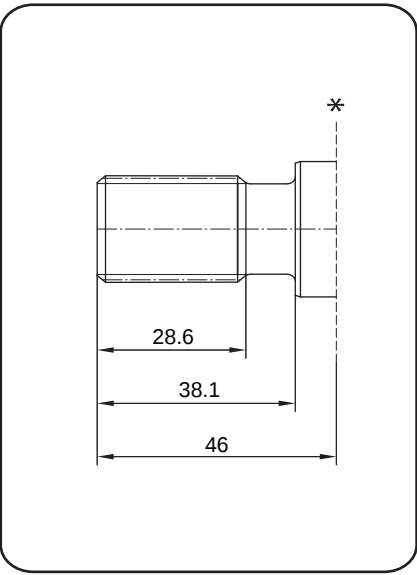


code R

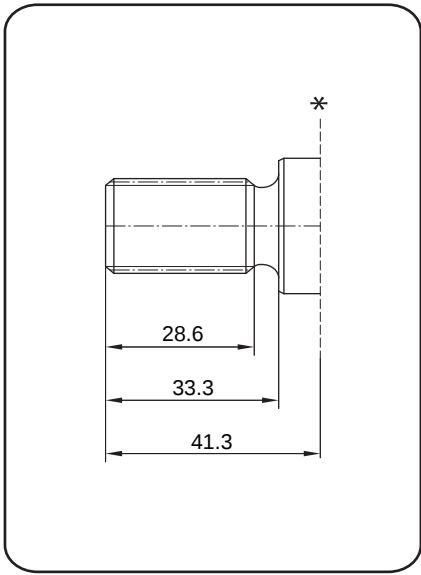


code AP

INVOLUTE SPLINE SHAFTS



code Q

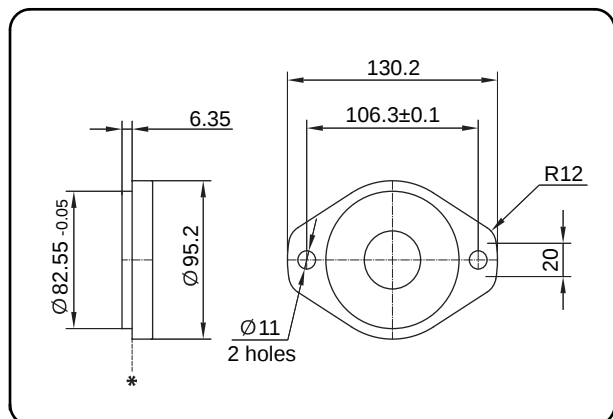


code B

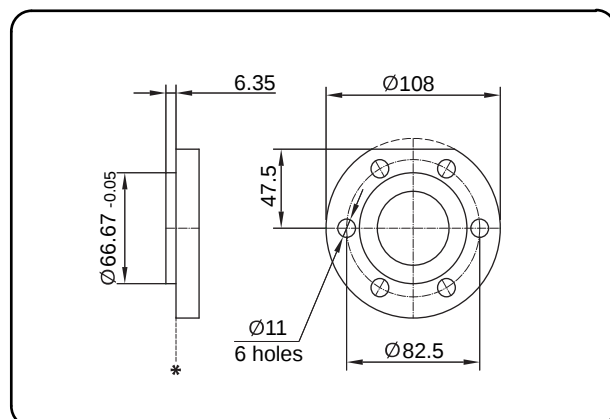
* standard flange mounting surface

	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code Q	SAE BB	flat root	16/32	30°	15	24,97/ 24,87
	1"					
code B	SAE B	flat root	16/32	30°	13	21,79/ 21,66
	7/8"					

SAE A

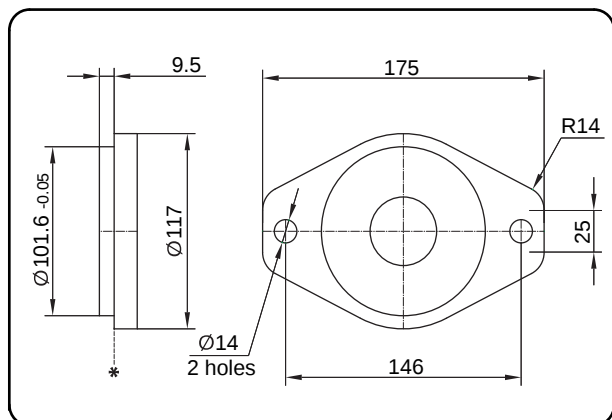


code 1

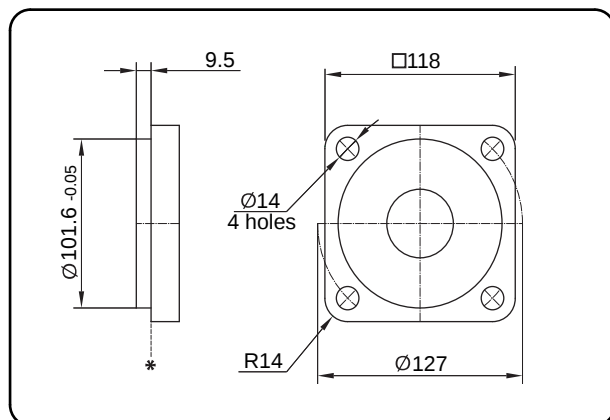


code 8

SAE B

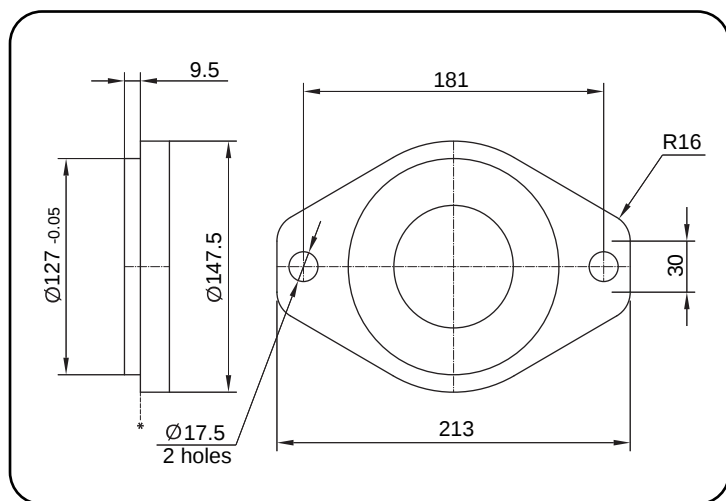


code 2

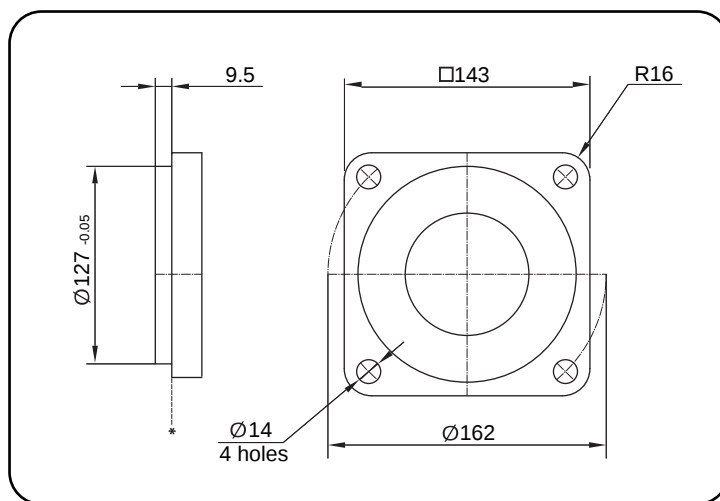


code 3

SAE C

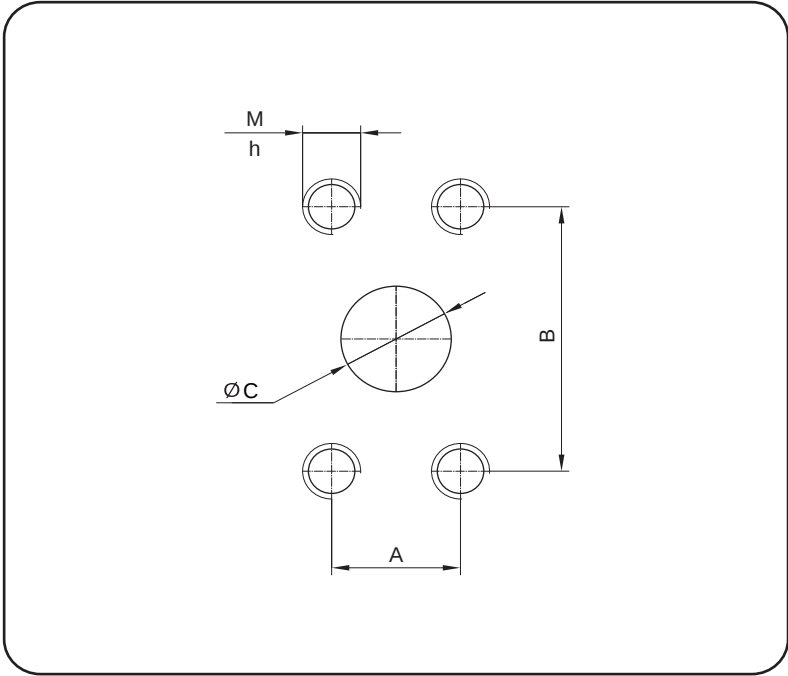


code 4

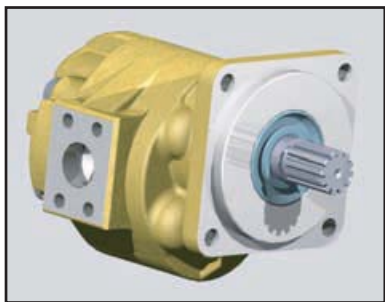


code 5

* standard flange mounting surface



MOTORS							TYPE	PUMPS													
INLET/OUTLET								INLET						OUTLET							
B2		B2/B26			B26			B2		B2/B26		B26		B2		B2/B26			B26		
M	h	A	B	C	M	h		M	h	A	B	C	M	h	M	h	A	B	C	M	h
3/8 UNC	28,6	22,2	47,6	19	M10	25	1905	3/8 UNC	28,6	26,2	52,4	25	M10	25	3/8 UNC	28,6	22,2	47,6	19	M10	25
		1907																			
		1909																			
		1911																			
7/16 UNC		30,2	58,7	31			1913	1/2 UNC		35,7	69,8	38	M12		7/16 UNC		30,2	58,7	31		

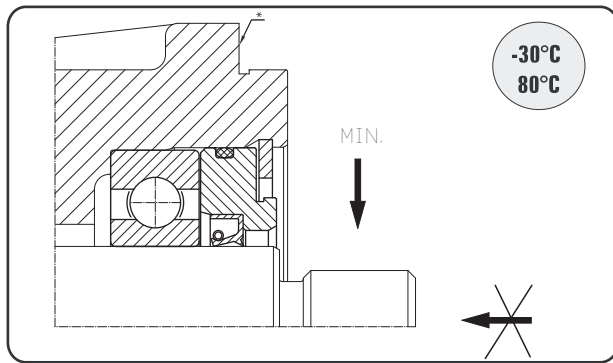


Model	2110	2113	2116	2120	2125
Displacement [ccm/rev]	44,0	57,4	70,5	88,2	110,6
Rated pressure [MPa]	17	17	16	16	14
Max speed [rpm]	pumps 2700 motors 3000				
Max torque motors [Nm]	107	141	157	196	218

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

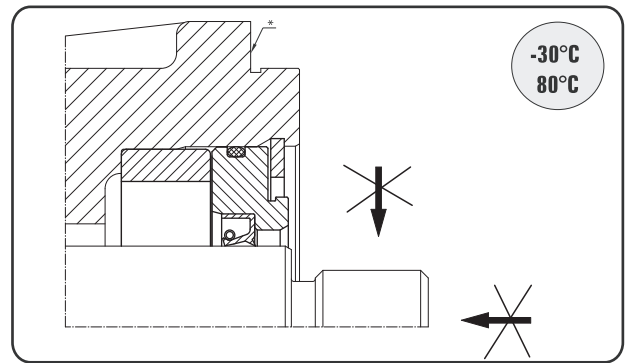
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P	2	C	P	2110	C	2	C25	C
P M	2	A B C E A2P A2PV C2P C2PV	roller - plain	2110 2113 2116 2120 2125	B C,Q AP R G L	2 3 4 5 8	B1 B2 B25 B26	A C D



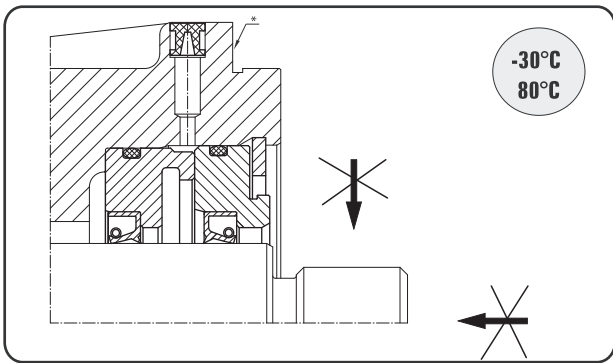
code A

Suitable for drives with limited radial load



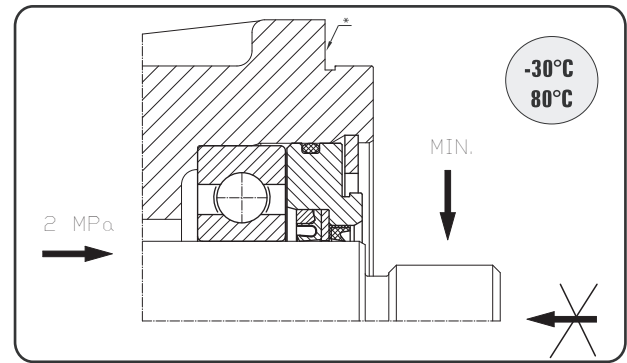
code B

Suitable for drives with no load



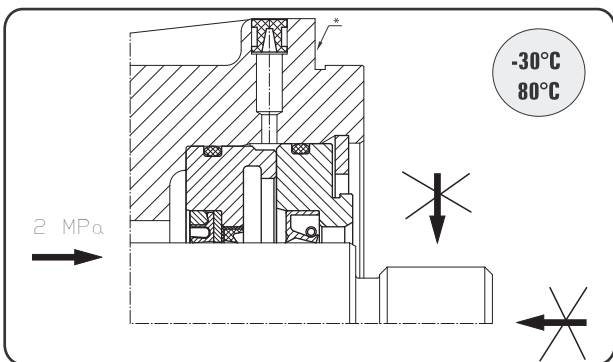
code C

Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes



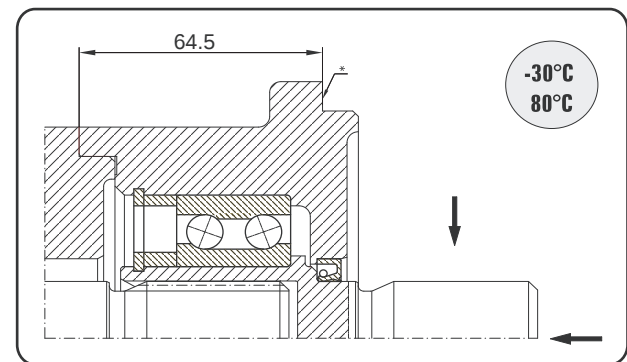
code A2P, A2PV

Options of high pressure shaft seal suitable for drives with limited radial load



code C2P, C2PV

Options of high pressure shaft seal suitable for drives with no load visible-bleed drilling

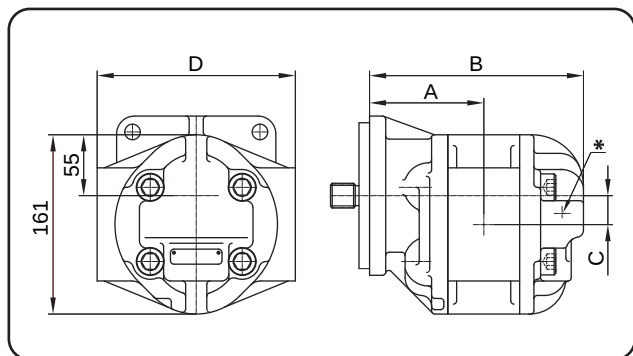


code E

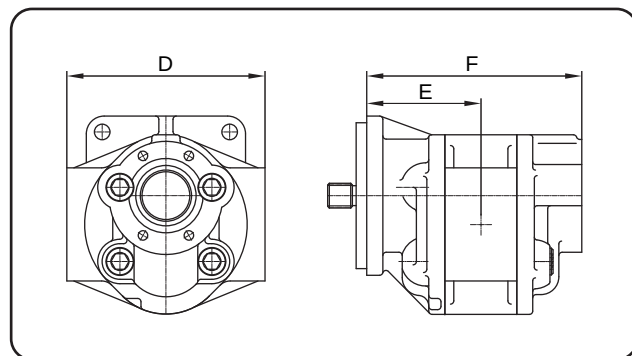
Suitable for drives with heavy axial load and some radial on to drive shaft

2P-bi-rotation no check valves with external drain.
2PV-bi-rotation with check valves.

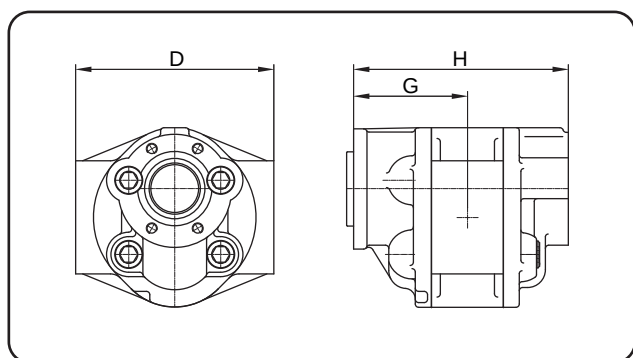
* standard flange mounting surface



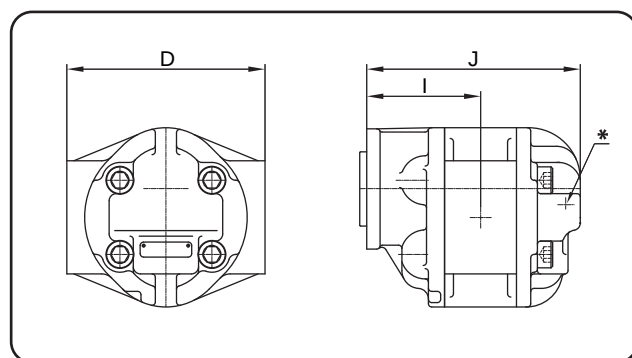
Single unit



Front unit



Intermediate unit

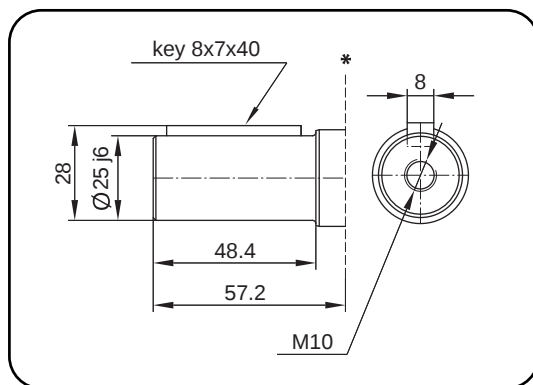


Rear unit

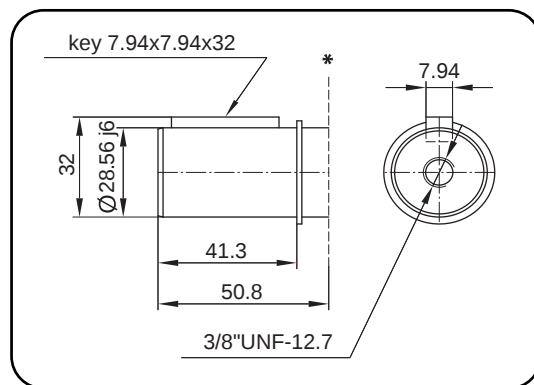
	Single unit				Front unit			Intermediate unit			Rear unit			
SIZE	A	B	C	Weight [kg]	E	F	Weight [kg]	G	H	Weight [kg]	I	J	Weight [kg]	D*
2110	98	184	26	18,2	98	185	18,2	98	185	18,4	98	184	18	178
2113	102	191	26	19	102	192	19	102	192	19,2	102	191	19	178
2116	106	200	26	20,5	106	202	20,5	106	202	20,7	106	200	20,3	178
2120	111	209	26	21,5	111	211	21,5	111	211	21,7	111	209	21,3	178
2125	117	222	26	25,9	117	224	25,9	117	224	26,1	117	222	25,7	178

* drain port for motors

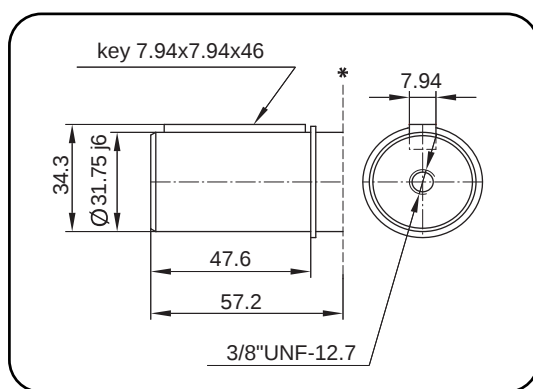
SHAFTS WITH KEY



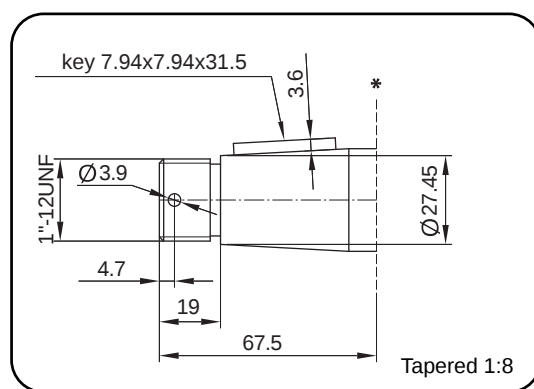
code AP



code R

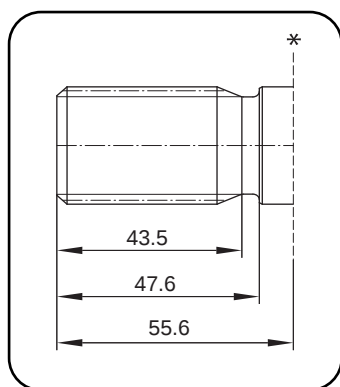


code G

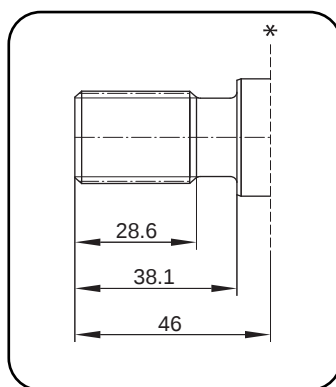


code L

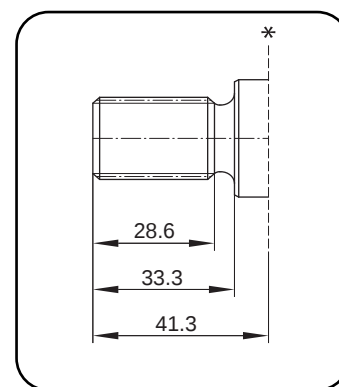
INVOLUTE SPLINE SHAFTS



code C



code Q

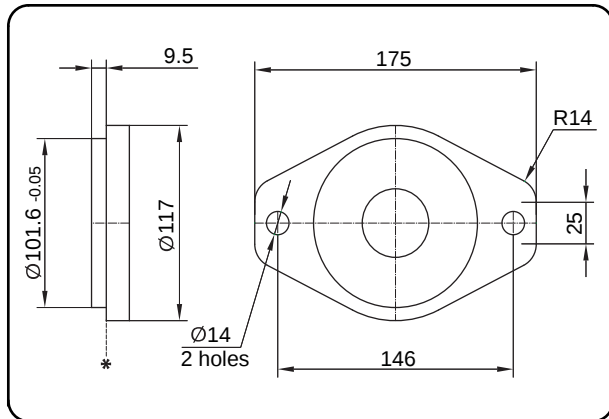


code B

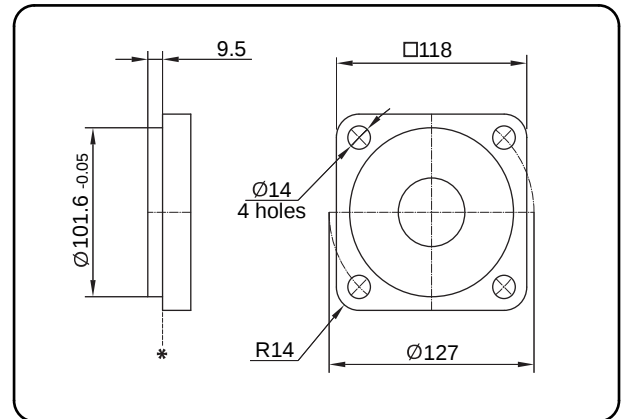
* standard flange mounting surface

	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code C	SAE C	flat root	12/24	30°	14	31,20/ 31,12
	1 1/4"					
code Q	SAE B	flat root	16/32	30°	15	24,97/ 24,87
	1"					
code B	SAE B	flat root	16/32	30°	13	21,79/ 21,66
	7/8"					

SAE B

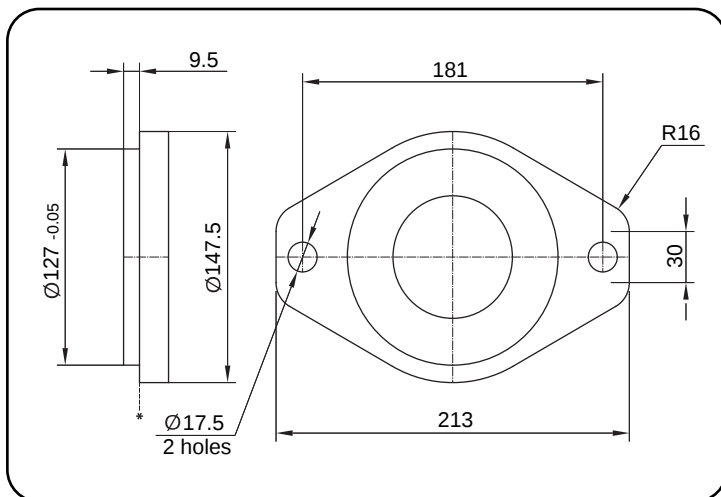


code 2

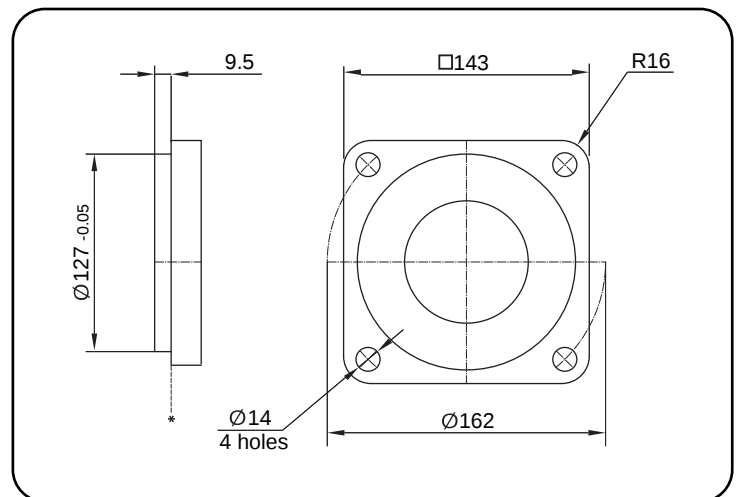


code 3

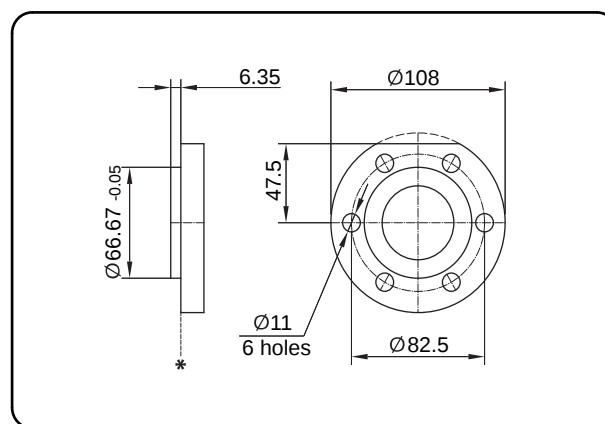
SAE C



code 4

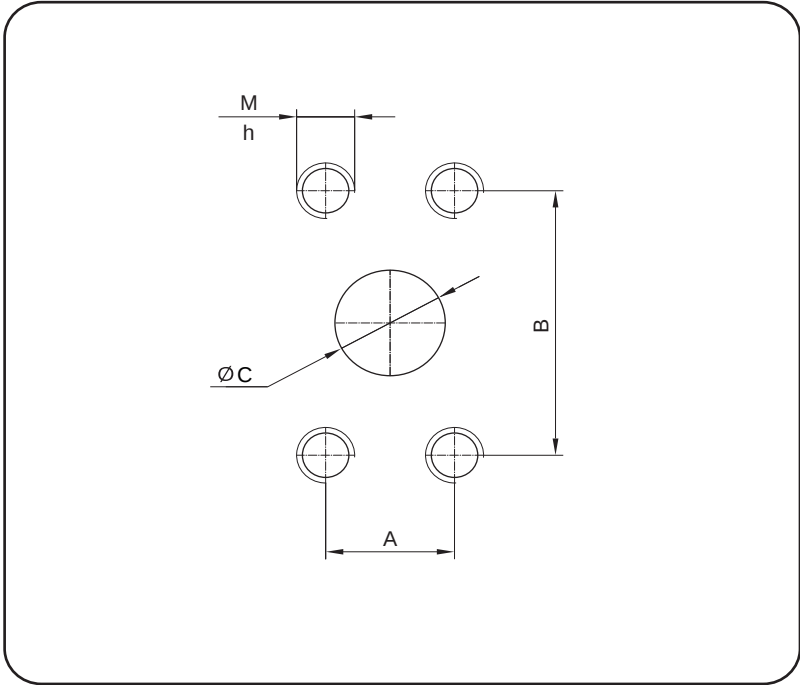


code 5

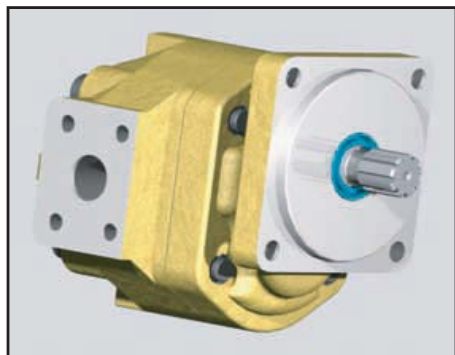


code 8

* standard flange mounting surface



MOTORS							TYPE	PUMPS													
INLET/OUTLET								INLET						OUTLET							
B1		B1/B25			B25			B2		B2/B26		B26		B2		B2/B26			B26		
M	h	A	B	C	M	h		M	h	A	B	C	M	h	M	h	A	B	C	M	h
3/8 UNC	16	26,2	52,4	25	M10	20		2107	7/16UNC	19	30,2	58,7	31	M12	20	3/8 UNC	16	26,2	52,4	25	M10
							2110														
							2113														
7/16 UNC	19	30,2	58,7	31	M12		2116	1/2 UNC	22	35,7	69,8	38	7/16 UNC			19	30,2	58,7	31	M12	
							2120														
1/2 UNC	22,5	35,7	69,8	38			2125			42,9	77,8	50			1/2 UNC	22,5	35,7	69,8	38		

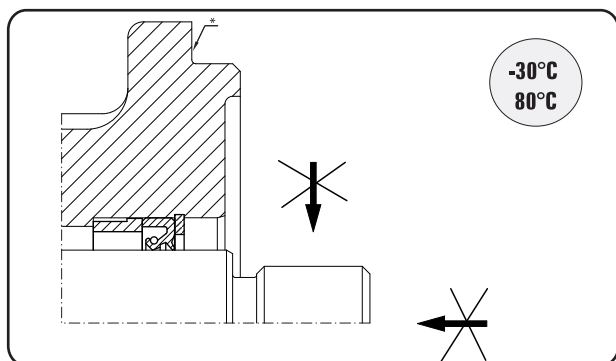


Model	2207	2208	2210	2213	2215	2216
Displacement [ccm/rev]	53,6	58,7	70,1	85,7	101,1	110,8
Rated pressure [MPa]	21	21	21	21	21	17
Max speed [rpm]	pumps 2700 motors 3000					
Max torque motors [Nm]	157	173	207	253	296	272

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

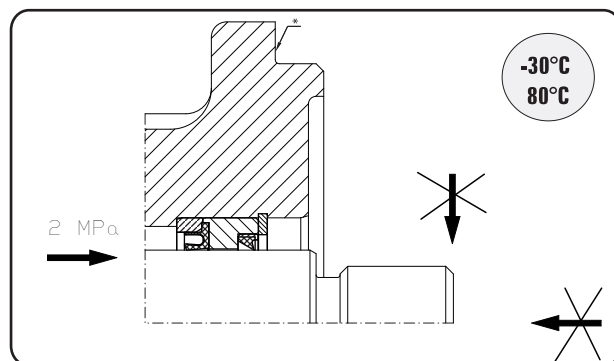
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P		C	P	2207	C	2	B26	C
P M		A C A2P A2PV C2P C2PV E	roller	2207 2208 2210 2213 2215 2216	B C AP G Q	2 3 4 5	B25 B26	A C D



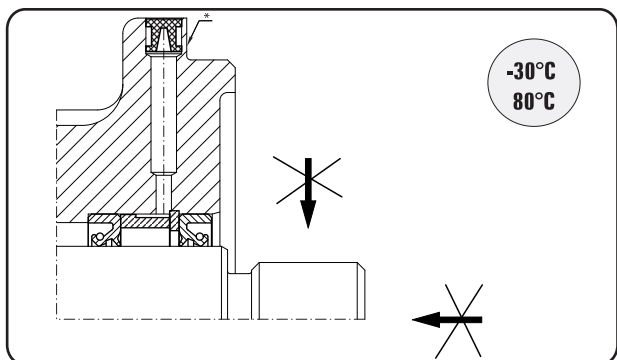
code A

Suitable for drives with limited radial load



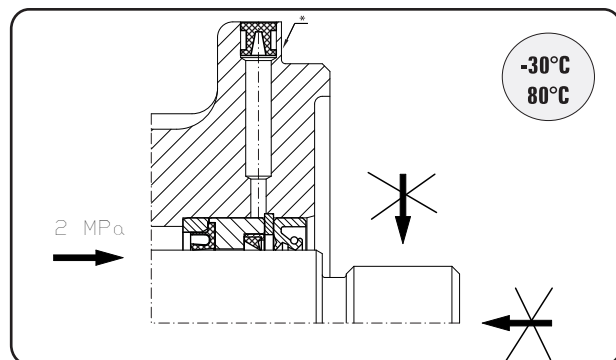
code A2P, A2PV

Options of high pressure shaft seal suitable for drives with limited radial load



code C

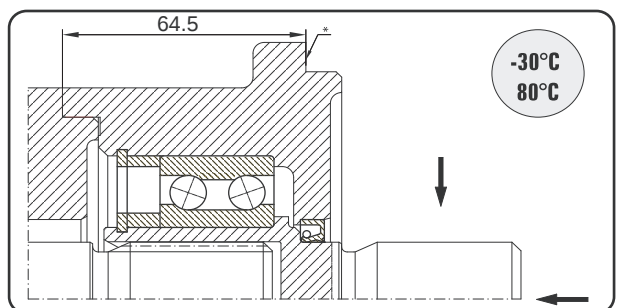
Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes



code C2P, C2PV

Options of high pressure shaft seal suitable for drives with no load visible-bleed drilling

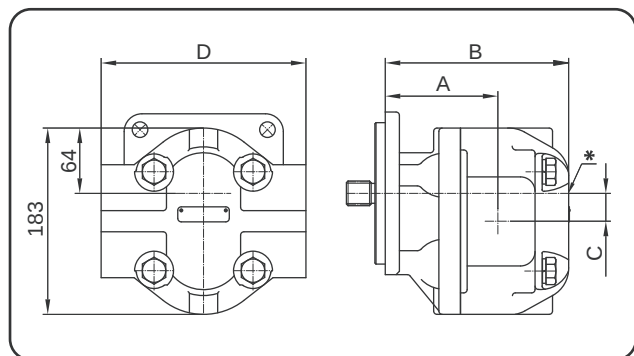
2P-bi-rotation no check valves with external drain.
2PV-bi-rotation with check valves.



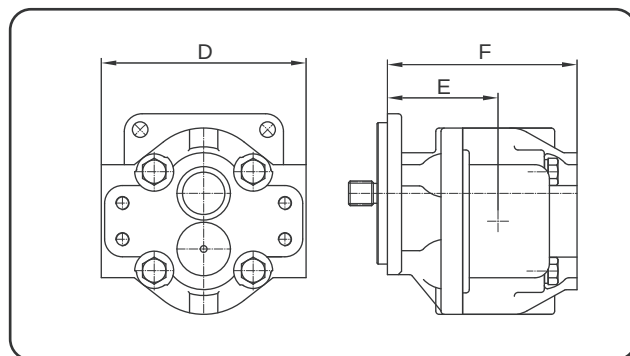
code E

Suitable for drives with heavy axial load and some radial on to drive shaft

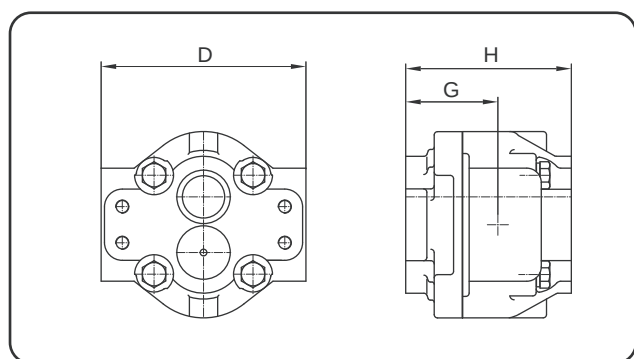
* standard flange mounting surface



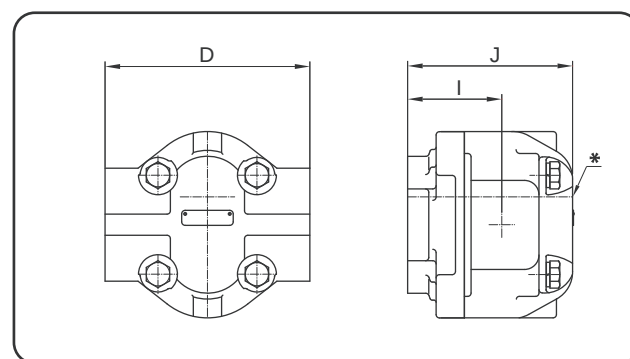
Single unit



Front unit



Intermediate unit

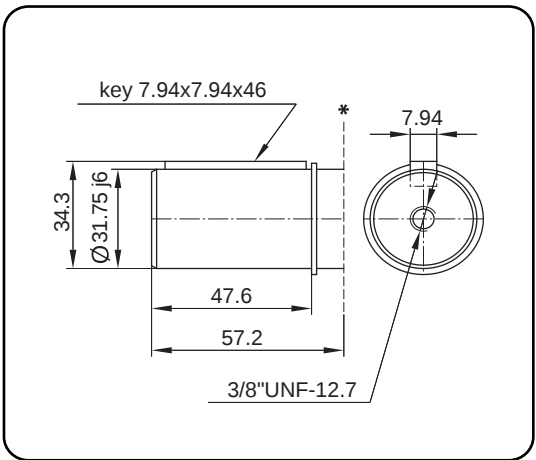


Rear unit

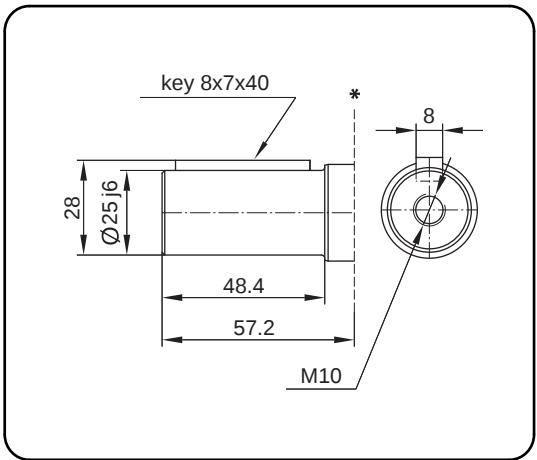
	Single unit				Front unit			Intermediate unit			Rear unit			
SIZE	A	B	C*	Weight [kg]	E	F	Weight [kg]	G	H	Weight [kg]	I	J	Weight [kg]	D
2208	109	170	27,5	22,3	109	178	23,8	97	167	22,2	97	159	20,0	187,3
2210	109	170	27,5	22,5	109	178	23,9	97	167	22,3	97	159	20,0	187,3
2213	116	176	27,5	23	116	184	24,3	105	173	22,4	105	165	21,0	187,3
2215	116	186	27,5	23,1	116	194	25,0	105	183	23,0	105	175	21,4	187,3
2216	116	186	27,5	23,4	116	194	25,0	105	183	23,1	105	175	21,5	187,3

* drain part for motors

SHAFTS WITH KEY

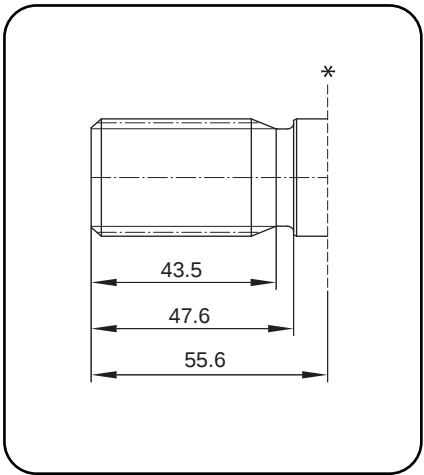


code G

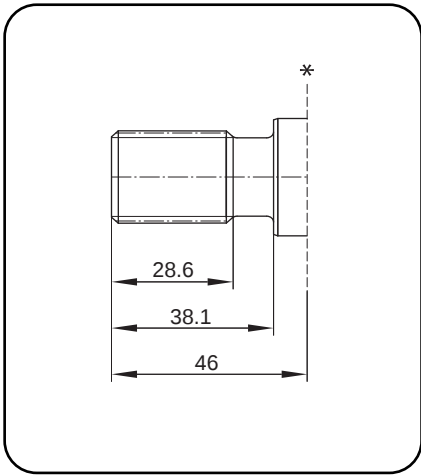


code AP

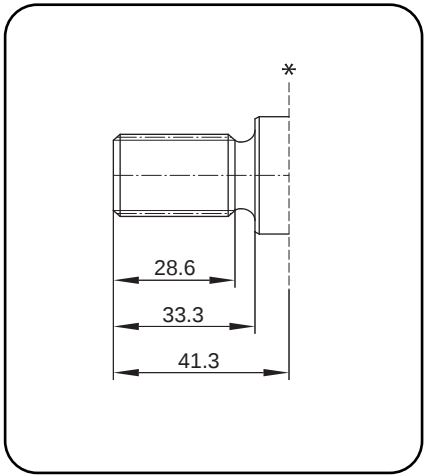
INVOLUTE SPLINE SHAFTS



code C



code Q

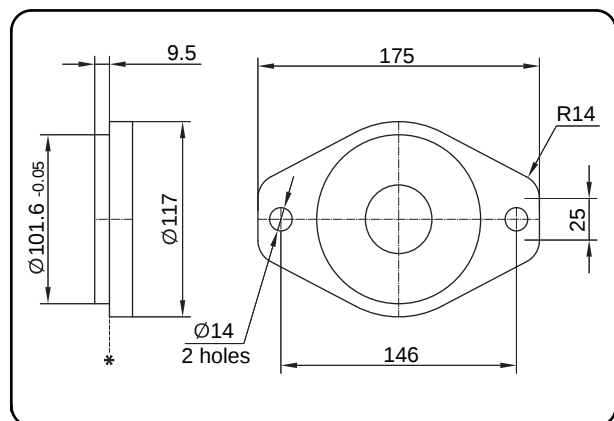


code B

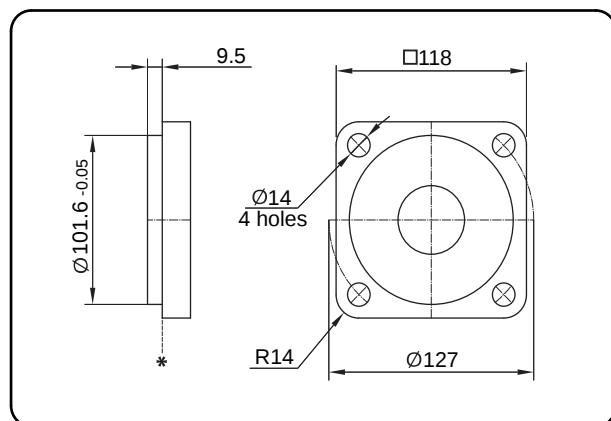
* standard flange mounting surface

	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code C	SAE C	flat root	12/24	30 °	14	31,20/ 31,12
	1 1/4"					
code Q	SAE BB	flat root	16/32	30 °	15	24,97/ 24,87
	1"					
code B	SAE B	flat root	16/32	30 °	13	21,79/ 21,66
	7/8"					

SAE B

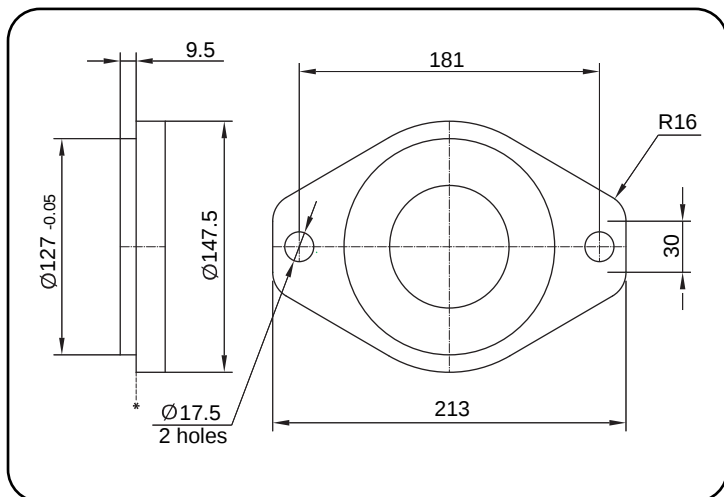


code 2

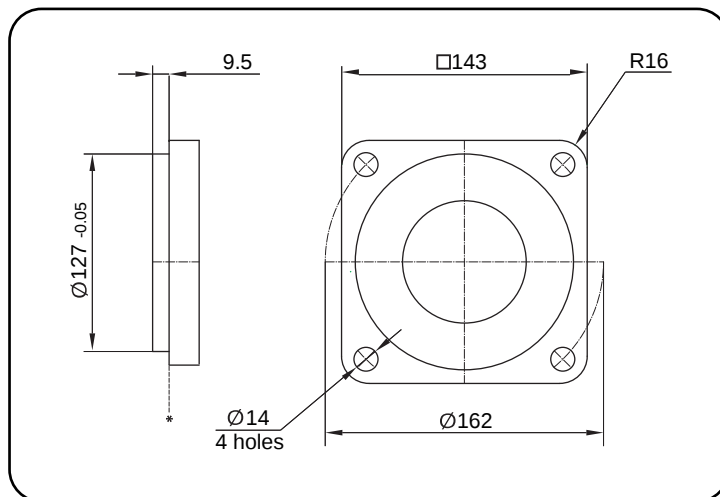


code 3

SAE C

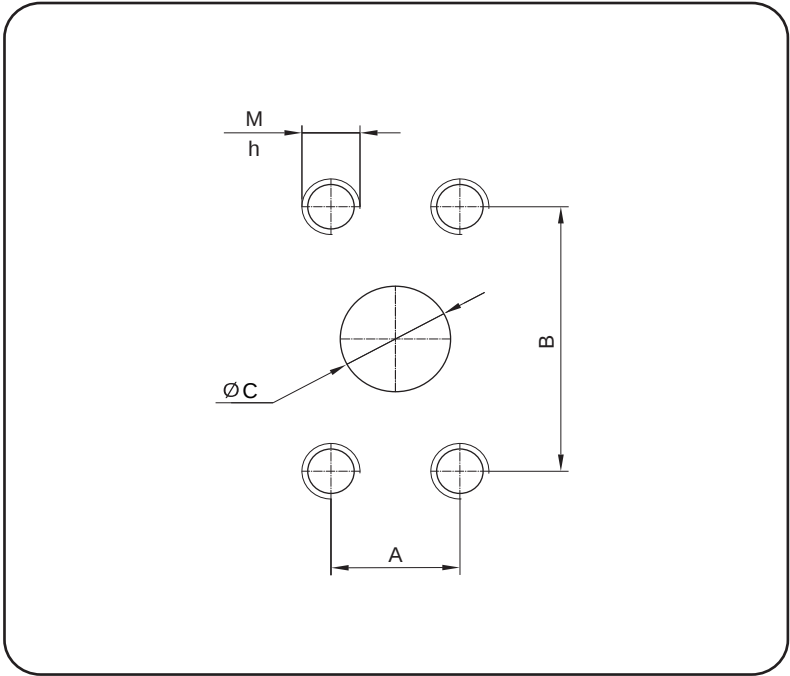


code 4

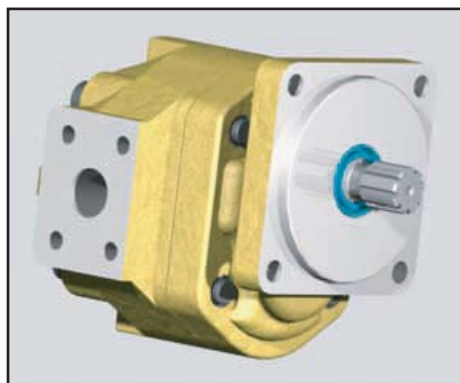


code 5

* standard flange mounting surface



MOTORS							TYPE	PUMPS														
INLET/OUTLET								INLET						OUTLET								
B1		B1/B25			B25			B2		B2/B26			B26		B2		B2/B26			B26		
M	h	A	B	C	M	h		M	h	A	B	C	M	h	M	h	A	B	C	M	h	
3/8 UNC	28,6	26,2	52,4	25	M10	25		2208	1/2-13 UNC	28,6	35,7	69,8	38	M12	25	7/16-14 UNC	28,6	30,2	58,7	31	M10	25
7/16 UNC		30,2	58,7	31			2210															
1/2-13 UNC		35,7	69,8	38			M12	2213														
		2215																				
			2216																			

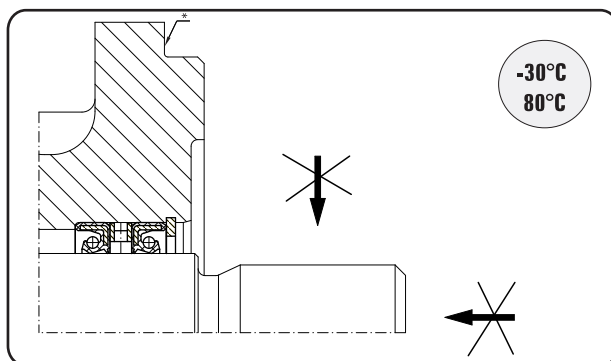


Model	2411	2413	2415	2416	2419
Displacement [ccm/rev]	87,3	103,6	119,8	132,7	155,4
Rated pressure [MPa]	21				
Max speed [rpm]	2700				

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

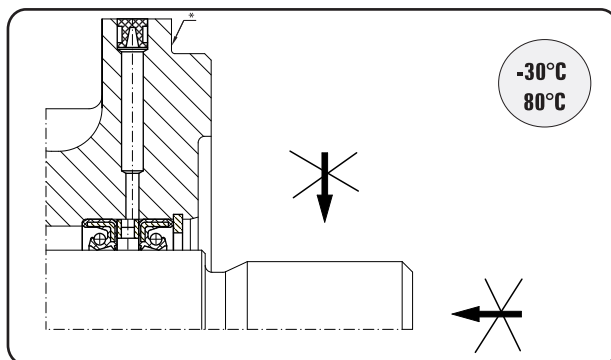
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P				2411	C	4	B26	C
P		A C E	roller	2411 2413 2415 2416 2419	C G L	4 5	B26	A C



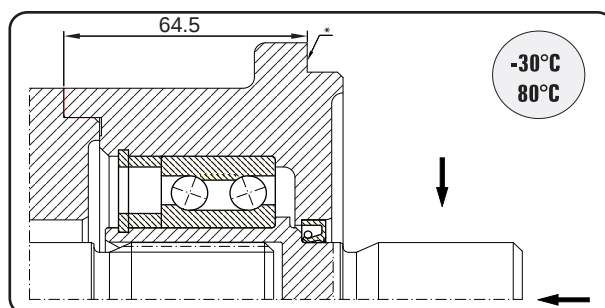
code A

Suitable for drives with load



code C

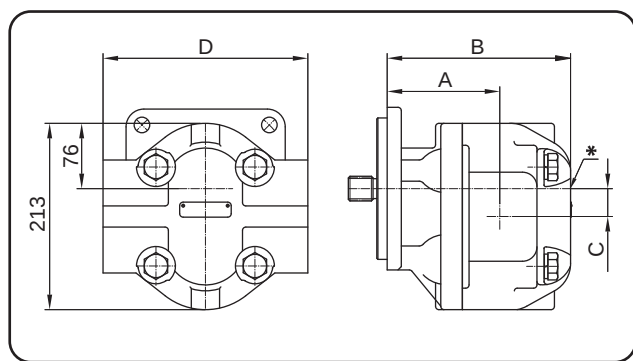
Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes



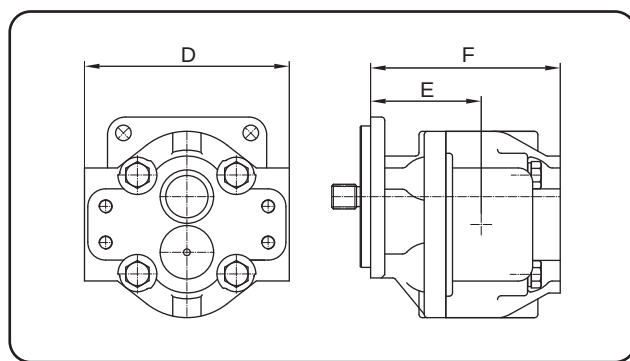
code E

Suitable for drives with heavy axial load and some radial on to drive shaft

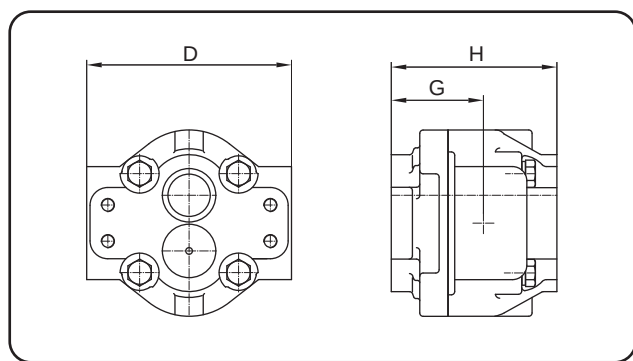
* standard flange mounting surface



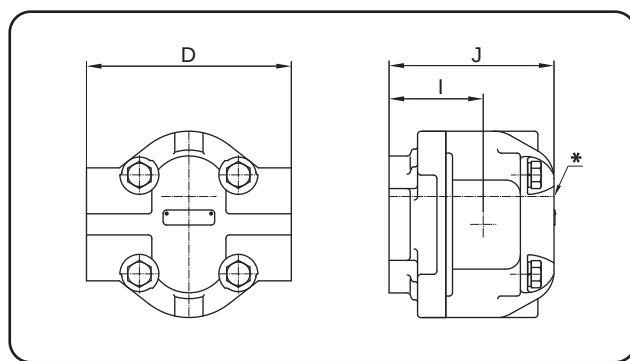
Single unit



Front unit



Intermediate unit

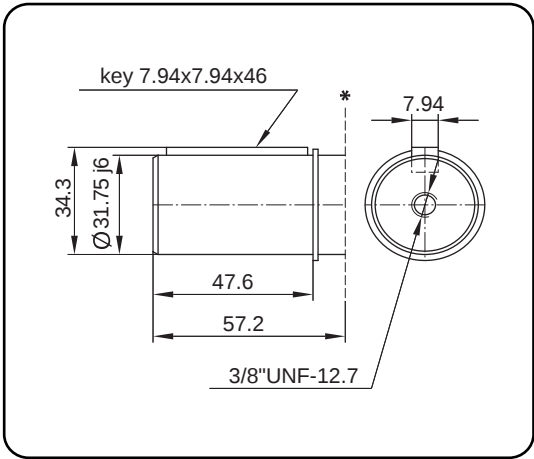


Rear unit

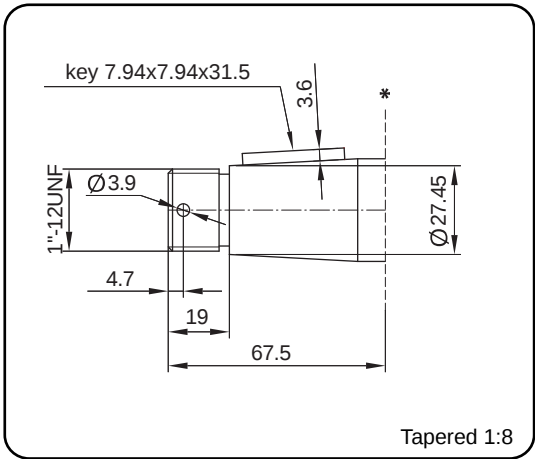
	Single unit				Front unit			Intermediate unit			Rear unit			
SIZE	A	B	C*	WEIGHT [kg]	E	F	WEIGHT [kg]	G	H	WEIGHT [kg]	I	J	WEIGHT [kg]	D
2411	111	178	30,2	29	115	192	30	99	176	29	95	162	28	193,6
2413	111	178	30,2	29	115	197	30	99	181	29	95	162	28	193,6
2415	118	188	30,2	30	115	203	30	99	187	30	102	172	29	193,6
2416	118	188	30,2	30	121	207	31	105	191	30	102	172	29	193,6
2419	121	203	30,2	30	121	207	31	105	191	30	105	187	30	193,6

* dimension refers to all pictures

SHAFTS WITH KEY

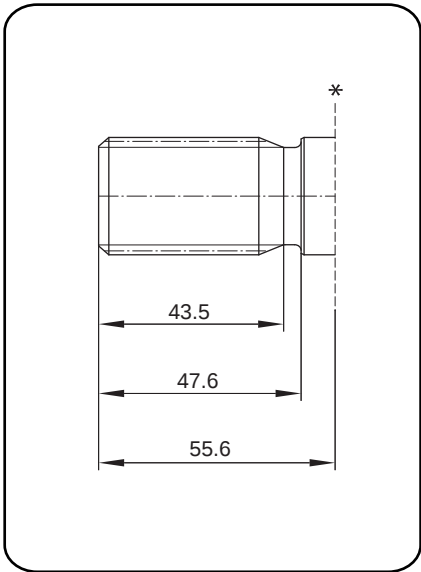


code G



code L

INVOLUTE SPLINE SHAFTS

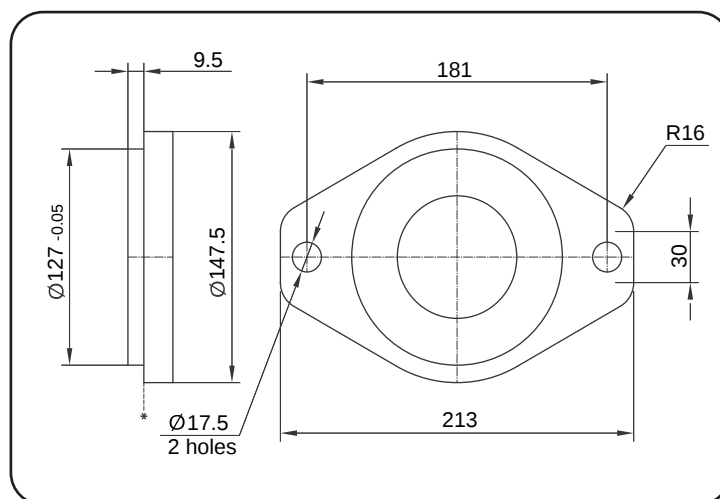


code C

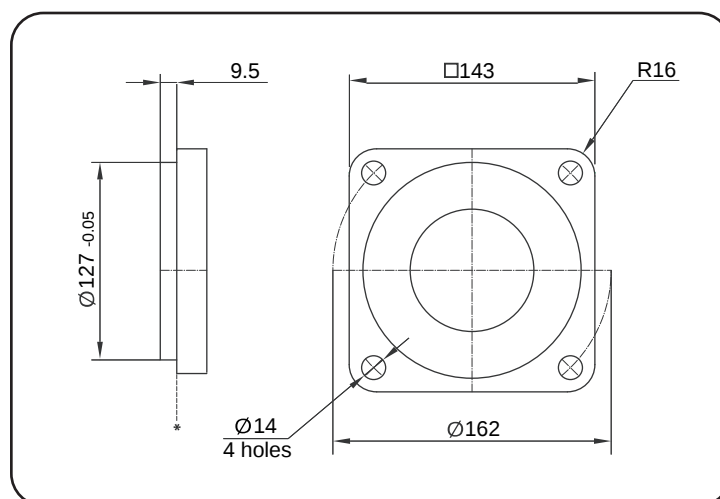
* standard flange mounting surface

	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code C	SAE C	flat root	12/24	30 °	14	31,20/ 31,12
	1 1/4"					

SAE C

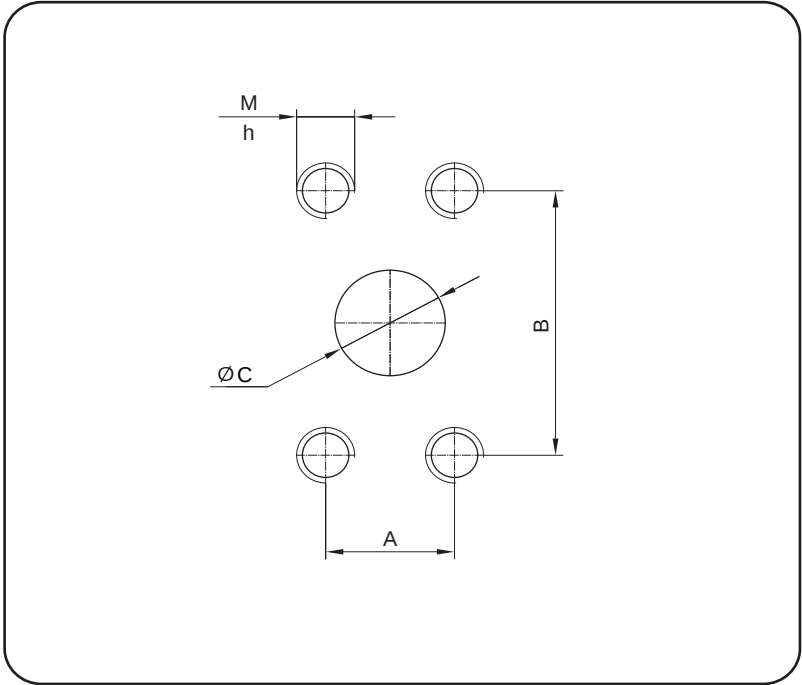


code 4

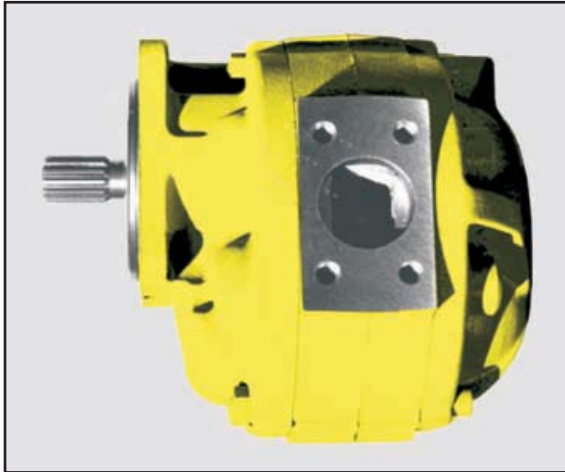


code 5

* standard flange mounting surface



TYPE	PUMPS													
	INLET							OUTLET						
	B2		B2/B26			B26		B2		B2/B26			B26	
	M	h	A	B	C	M	h	M	h	A	B	C	M	h
2208	1/2-13 UNC	21	35,7	69,8	38	M12	25	7/16-14 UNC	19	30,2	58,7	31	M10	25
2210														
2213														
2215														
2216														

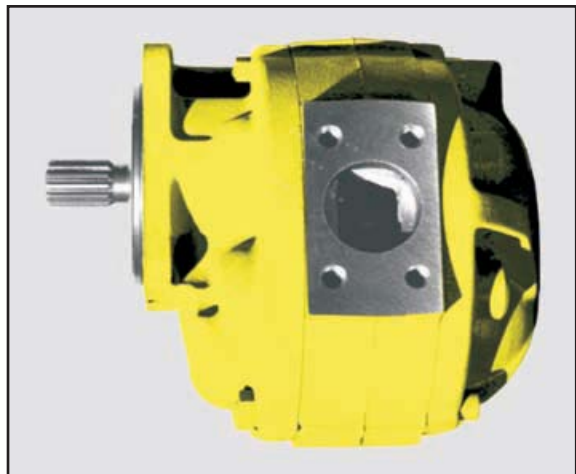


Model	3115	3120
Displacement [ccm/rev]	131,6	175,3
Rated pressure [MPa]	pumps 17,5 motors 15,5	
Max speed [rpm]	pumps 2700 motors 3000	
Max torque motors [Nm]	324	389

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P		C		3115	C	5	B26	C
P M		A C	roller	3115 3120	B C AP G Q	5	B25 B26	A C

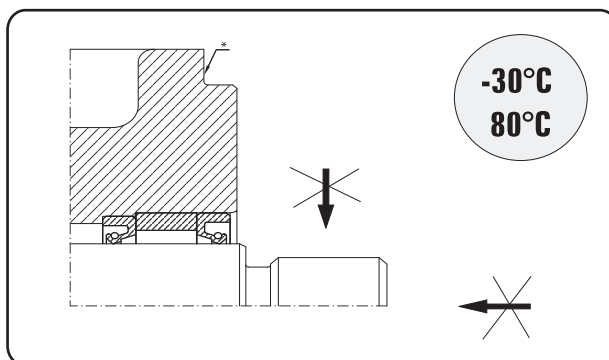


Model	3120	3125	3130	3135
Displacement [ccm/rev]	175,3	217,9	263,8	306,4
Rated pressure [MPa]	pumps 17,5 motors 15,5			
Max speed [rpm]	pumps 2700 motors 3000			
Max torque motors [Nm]	389	480	540	560

● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

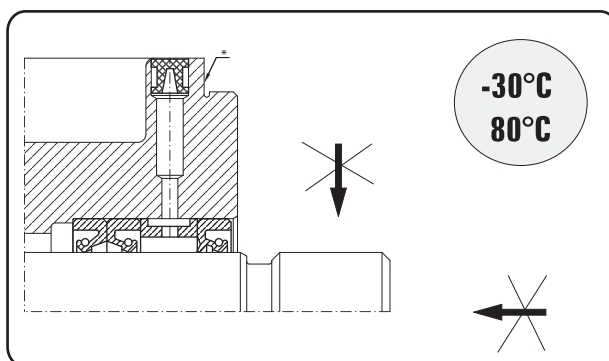
HOW TO ORDER

P-PUMP M-MOTOR	DESIGN LEVEL 1- without 2 or 3	SEAL DESIGN	BEARINGS roller - without plain - P	SIZE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise D- birotation
P	3	C		3125	C	5	B26	C
P M	3	A C	roller	3120	B C AP G Q	5	B25 B26	A C D
	3			3125				
	3			3130				
	3			3135				



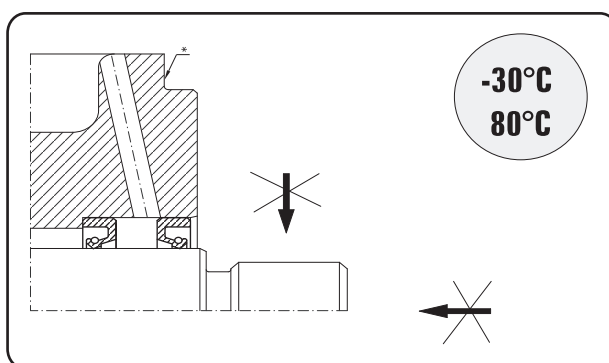
code A **3100 Model 1,3**

Suitable for drives with limited radial load



code C **3100 Model 1**

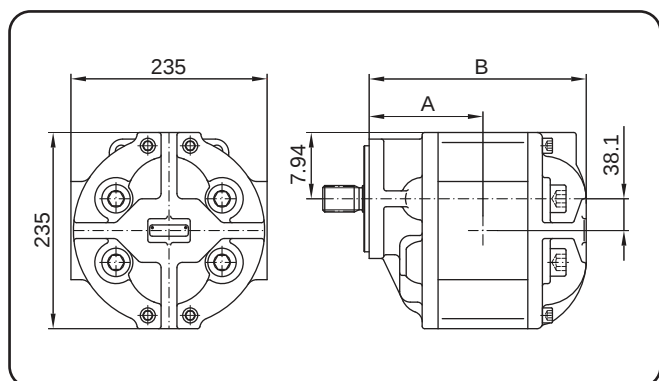
Visible-bleed drilling Suitable for drives with no load for direct mounting on torque converters and gear boxes



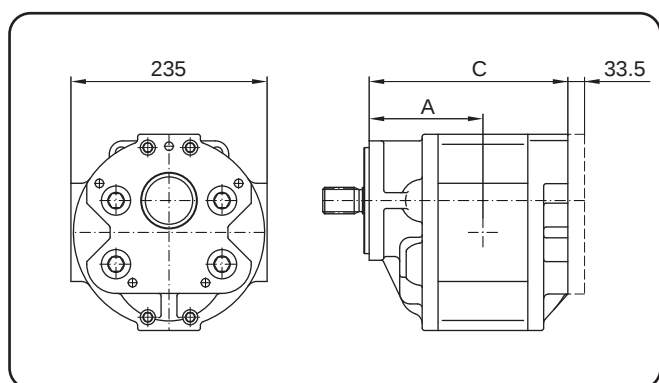
code C **3100 Model 3**

Visible-bleed drilling Suitable for drives with no load for direct mounting on torque converters and gear boxes

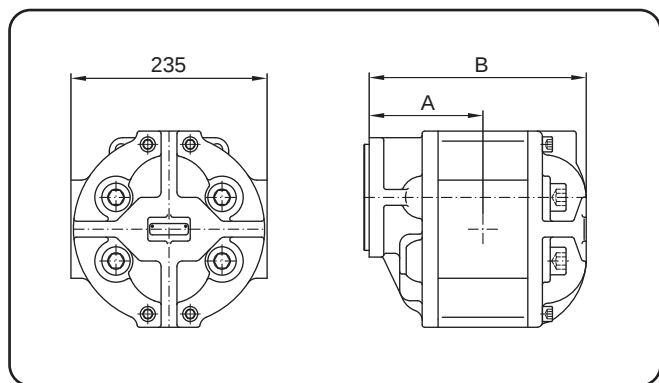
MODEL 1



Single unit



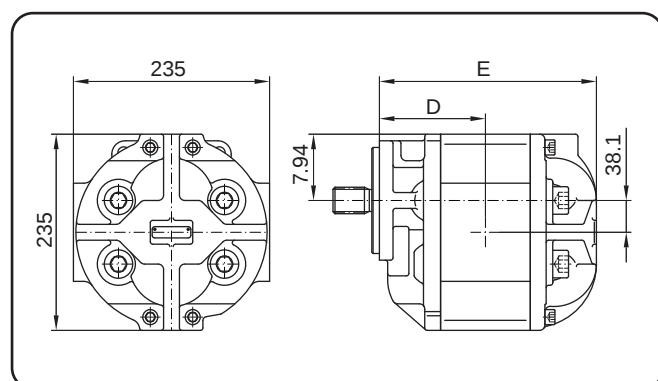
Front unit



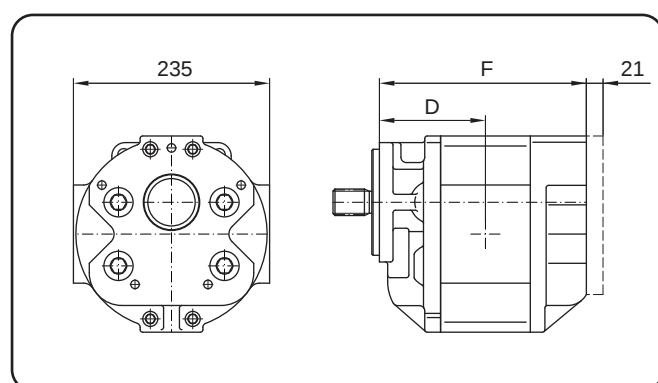
Rear unit

SIZE	A	B	C	WEIGHT [kg]
3115	111	210	188	41,8
3120	118	222	200	45,0

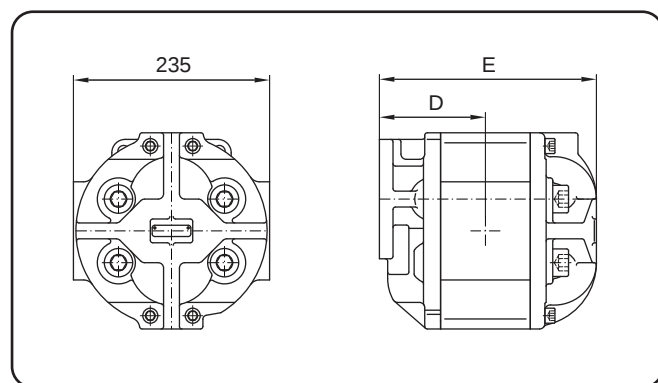
MODEL 3



Single unit



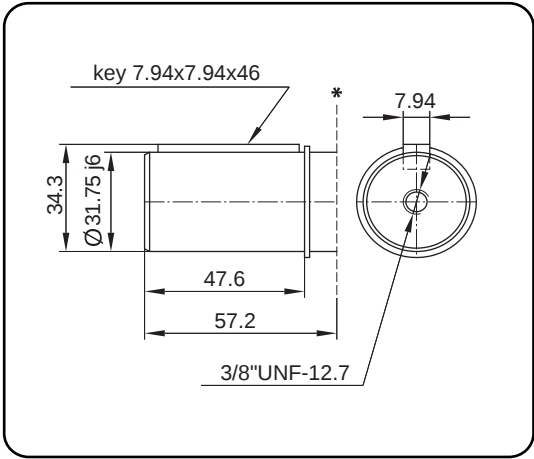
Front unit



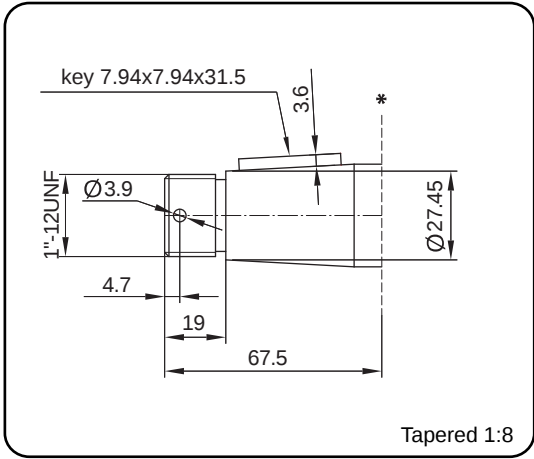
Rear unit

SIZE	D	E	F	WEIGHT [kg]
3120	117,5	241	229	54,5
3125	124	254	242	58,1
3130	130,5	267	255	61,7
3135	136,5	279	267	64,3

SHAFTS WITH KEY

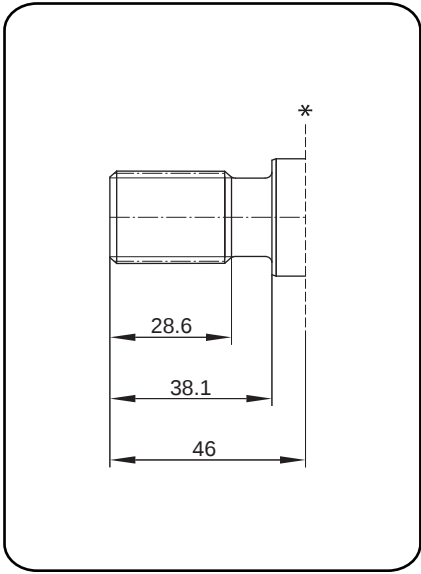


code G



code L

INVOLUTE SPLINE SHAFTS

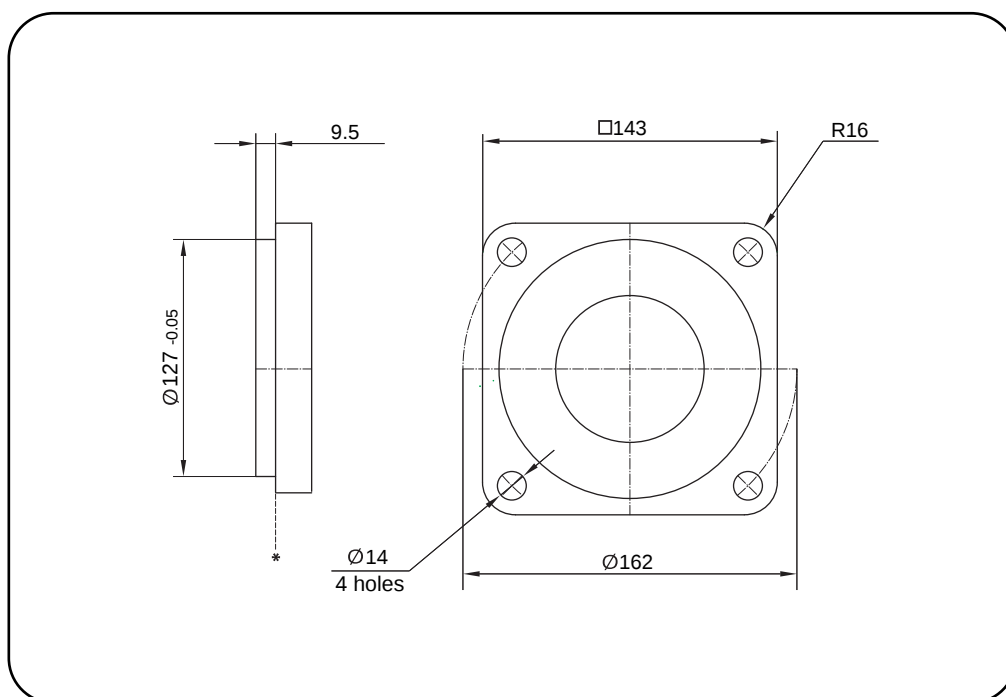


code C

* standard flange mounting surface

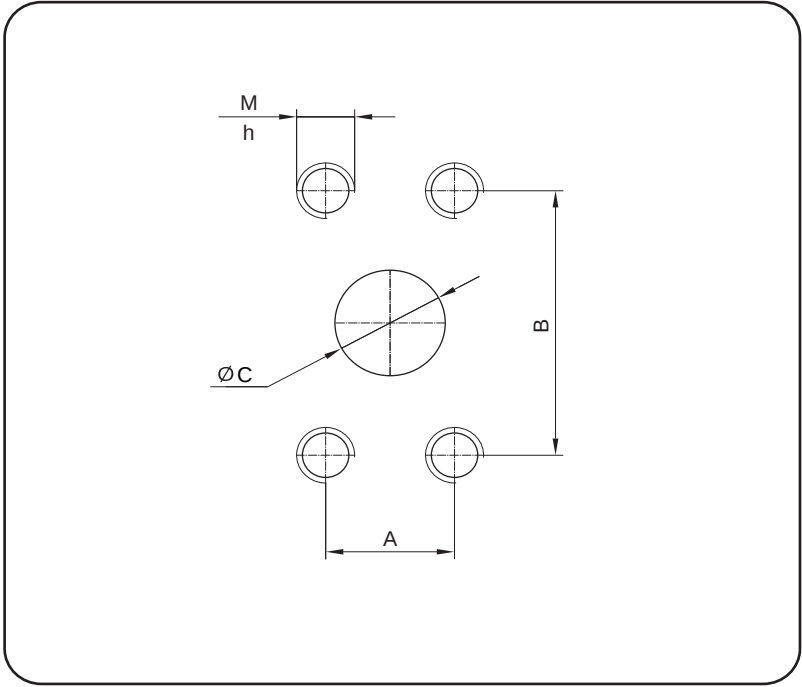
	size	side fit	diametral pitch	pressure angle	number of teeth	major diameter
code C	SAE C	flat root	12/24	30 °	14	31,20/ 31,12
	1 1/4"					

SAE C



code 5

* standard flange mounting surface

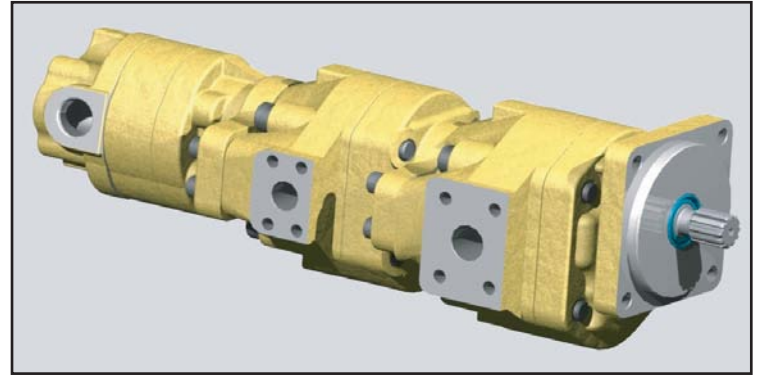
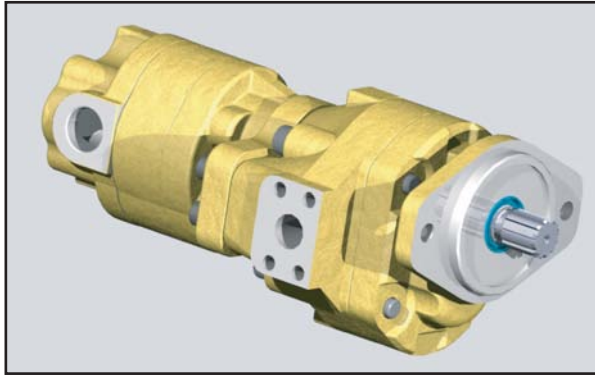


MOTORS							TYPE	PUMPS													
INLET/OUTLET								INLET						OUTLET							
B1		B1/B25			B25			B2		B2/B26			B26		B2		B2/B26			B26	
M	h	A	B	C	M	h		M	h	A	B	C	M	h	M	h	A	B	C	M	h
1/2-13 UNC	21	30,2	58,7	31	M12	20		3115	1/2-13 UNC	21	35,7	69,8	38	M12	25	7/16-14UNC	19	30,2	58,7	31	M12
		35,7	69,8	38			3120	42,9			77,8	50	1/2-13UNC			21	35,7	69,8	38		
							3125														
							3130														
		42,9	77,8	50			3135	50,8			88,9	63,5					42,9	77,8	50		

GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

MULTIPLE PUMPS/ MOTORS



HOW TO ORDER

P-PUMP M-MOTOR	Design level 1- without 2 or 3	Seal shaft	TYPE			Drive shafts	Flanges	Ports			Rotation A- anticlockwise C- clockwise D- birotation
			First section	Second section	Third section			First section	Second section	Third section	
P	2	C	2415	2210	1604	C	5	B26	B26	C23	C
			pages:			pages:		pages:			
			8,14,20,26, 32,39			10,16,22,28, 34,41		12,18,24,30, 36,43			
			9,15,21,27, 33,40			11,17,23,29, 35,42					

GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

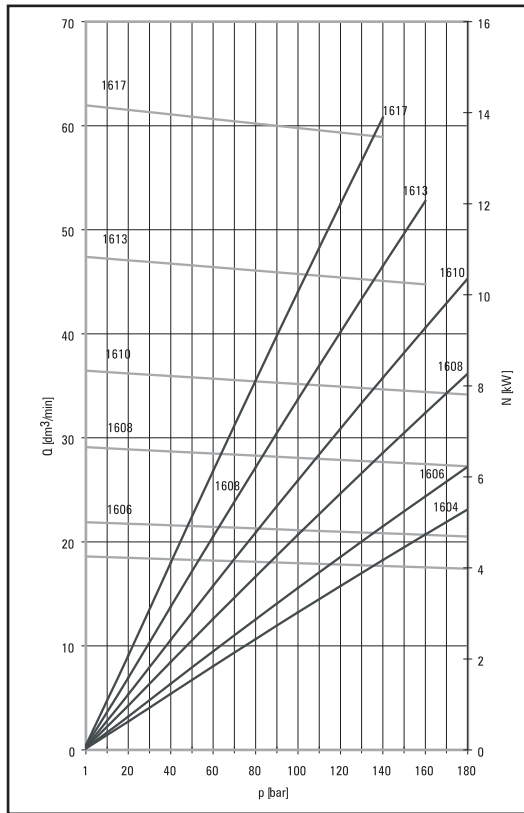
MULTIPLE PUMPS/ MOTORS HOW TO ORDER

P-PUMP M-MOTOR	Design level 1- without symbol 2 or 3	Seal shaft	Bearings	Common inlet	TYPE			Drive shafts	Flanges	PORTS			Rotation A- anticlockwise C- clockwise D- birotation
					First section	Second section	Third section			First section	Second section	Third section	
P	2	C			2415	2210	1604	C	5	B26	B26	C23	C
P M	2	A B C A2P A2PV C2P C2PV	roller		1604	1604	1604	A B V AD F	1 2 3 5 8	C21/E21 C23/E23 C5/E5 C9/E9 L32	C21/E21 C23/E23 C5/E5 C9/E9 L32	C21/E21 C23/E23 C5/E5 C9/E9 L32	A C D
					1606	1606	1606						
					1608	1608	1608						
					1610	1610	1610						
					1613	1613	1613						
					1617	1617	1617						
P M	2	A B C E A2P A2PV C2P C2PV	roller-plain		2110	2110	2110	B,Q C AP G L R	2 3 4 5 8	B1 B2 B25 B26	B1 B2 B25 B26	B1 B2 B25 B26	A C D
					2113	2113	2113						
					2116	2116	2116						
					2120	2120	2120						
					2125	2125	2125						
P M	1*	A C	roller		3115	3115	3115	C G L	5	B25 B26	B25 B26	B25 B26	A C D
	1*, 3				3120	3120	3120						
	3				3125	3125	3125						
					3130	3130	3130						
					3135	3135	3135						
P M	1* 2	A B C E A2P A2PV C2P C2PV	roller-plain		1905	1905	1905	B Q R AP	1 2 3 4 5 8	B25 B26	B25 B26	B25 B26	A C D
					1907	1907	1907						
					1909	1909	1909						
					1911	1911	1911						
					1913	1913	1913						
P M	1* 2	A B C E A2P A2PV C2P C2PV	roller-plain	J	2207	2207	2207	B,Q C G AP	2 3 4 5		B25 B26	B25 B26	
					2208	2208	2208						
					2210	2210	2210						
					2213	2213	2213						
					2215	2215	2215						
					2216	2216	2216						
P		A C E	roller		2411	2411	2411	C G L	4 5	B26	B26	B26	A C
					2413	2413	2413						
					2415	2415	2415						
					2416	2416	2416						

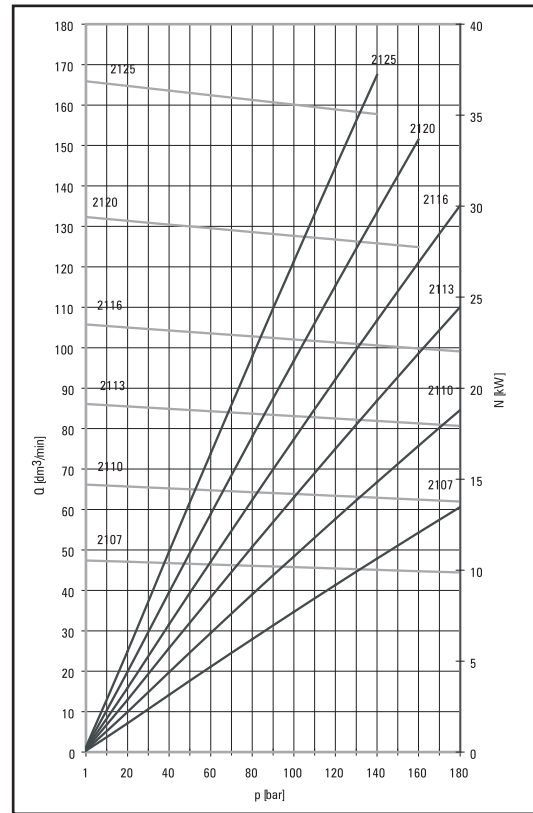
GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

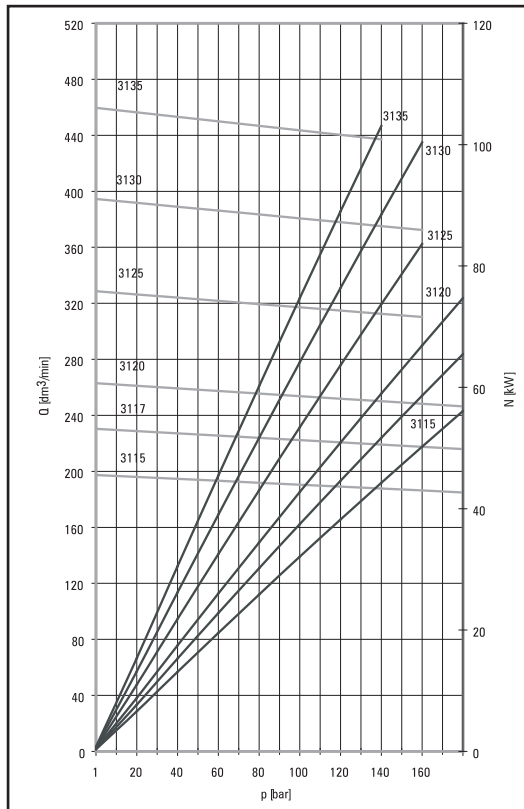
PUMP CHARACTERISTICS



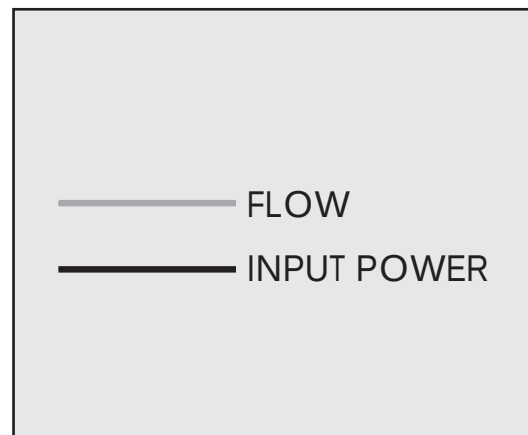
1600 SERIES



2100 SERIES



3100 SERIES

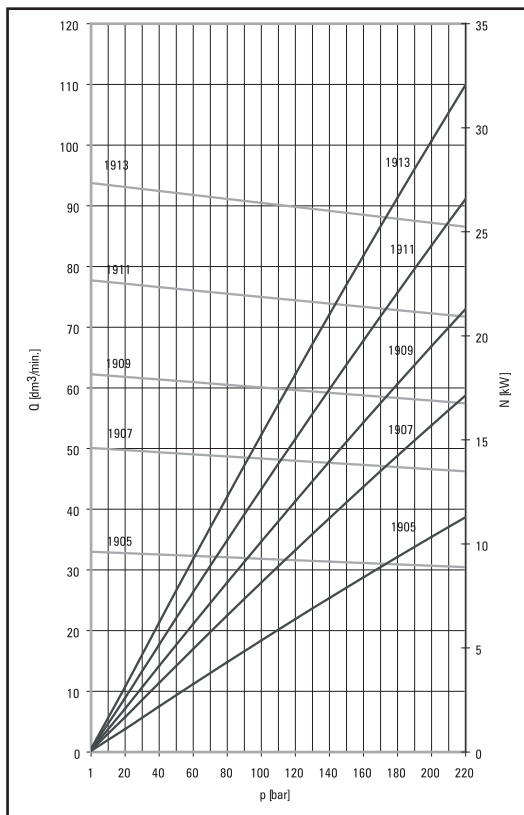


*Characteristic at shaft speed 1500 r.p.m.

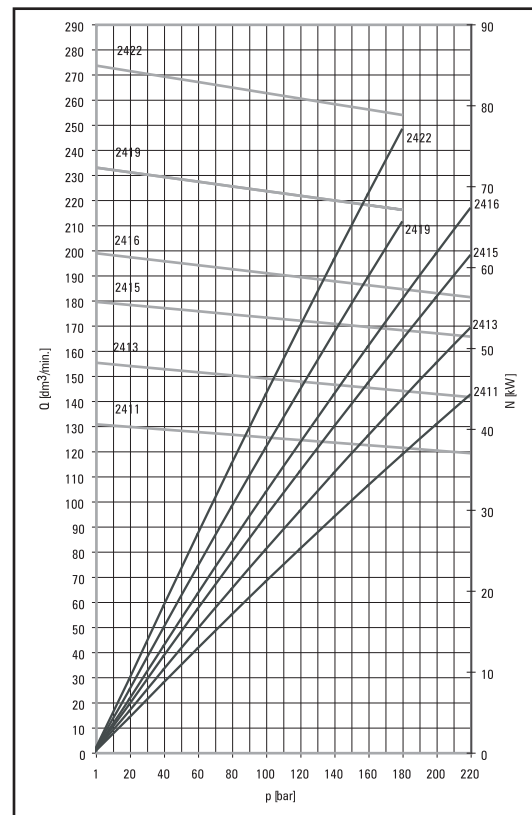
GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

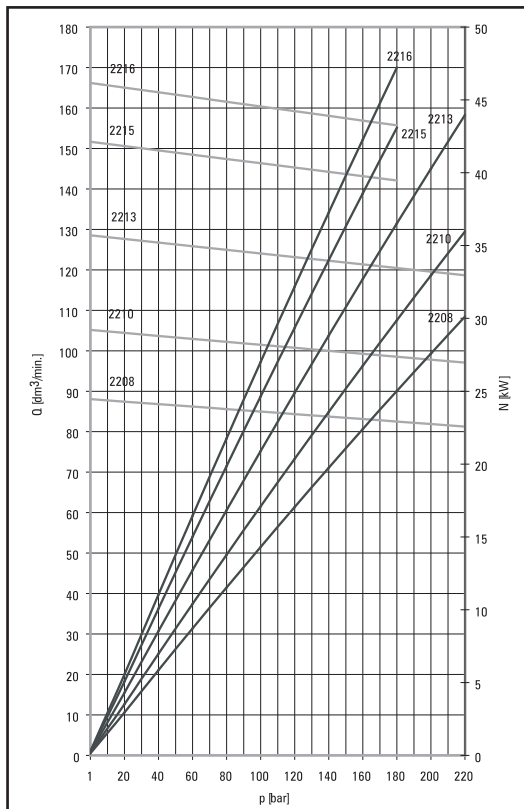
PUMP CHARACTERISTICS



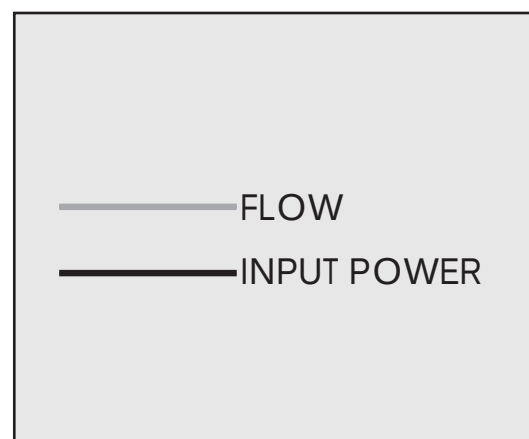
1900 SERIES



2400 SERIES



2200 SERIES

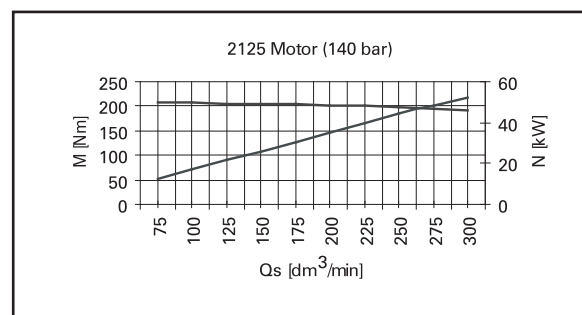
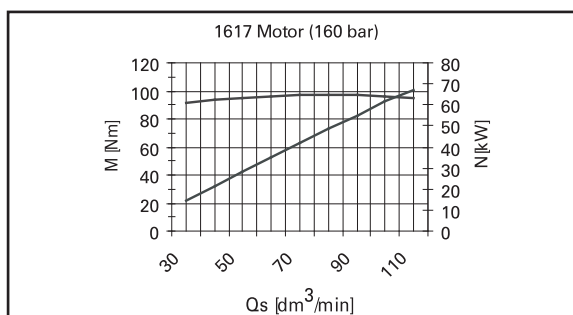
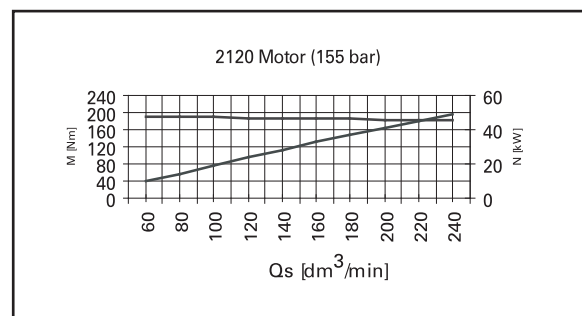
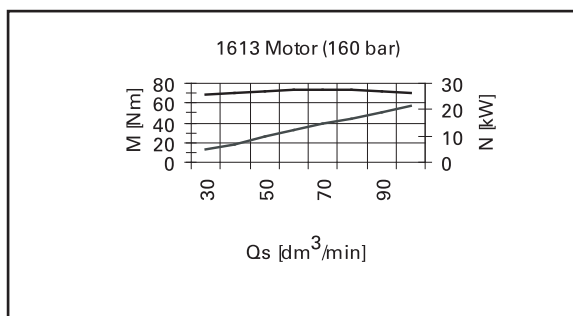
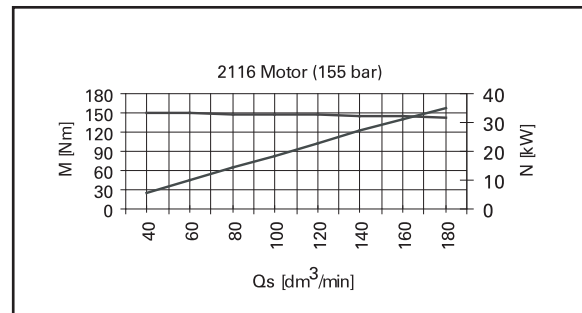
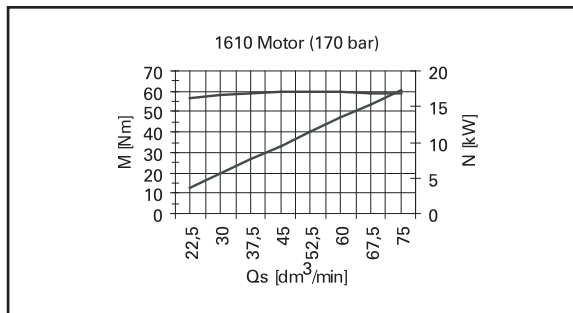
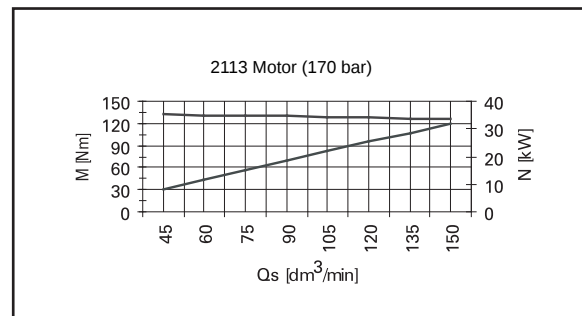
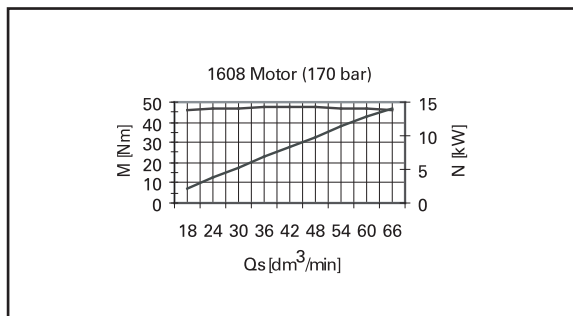
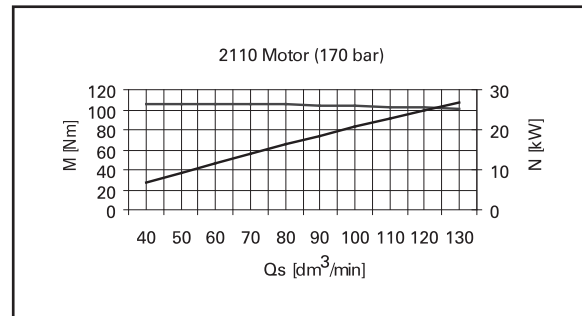
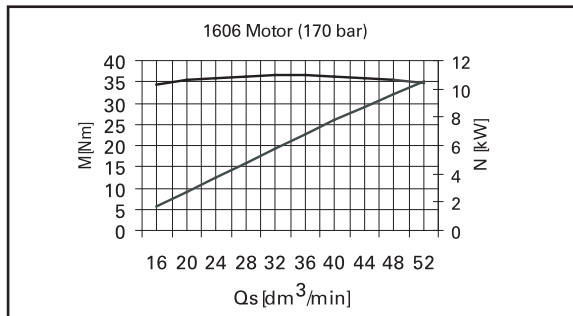


*Characteristic at shaft speed 1500 r.p.m.

GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

MOTOR CHARACTERISTICS



1600 SERIES

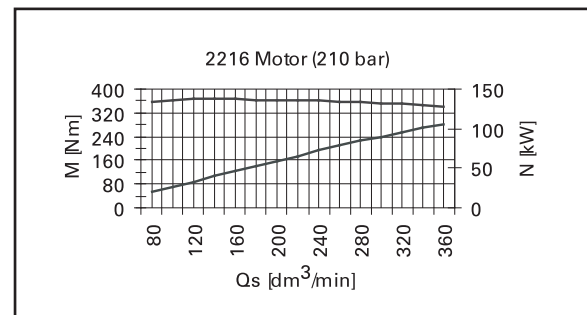
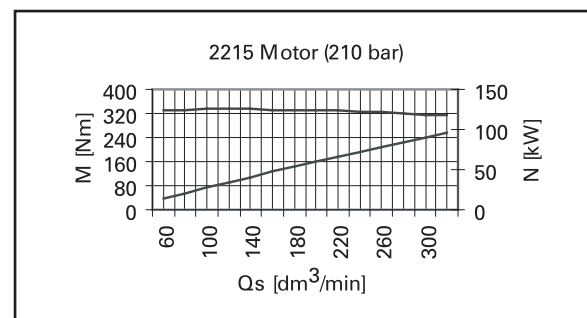
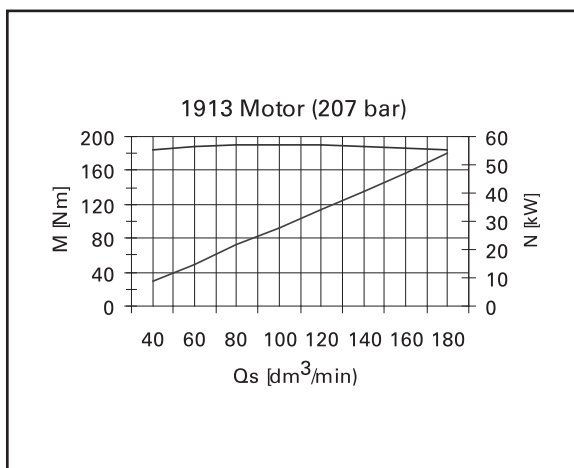
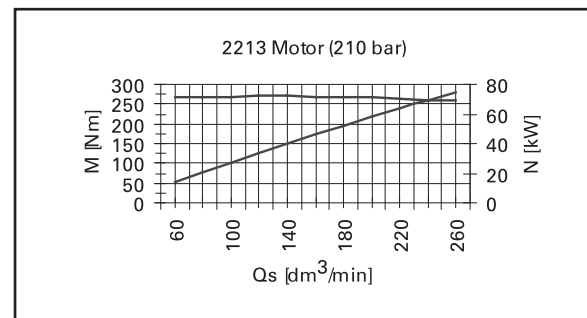
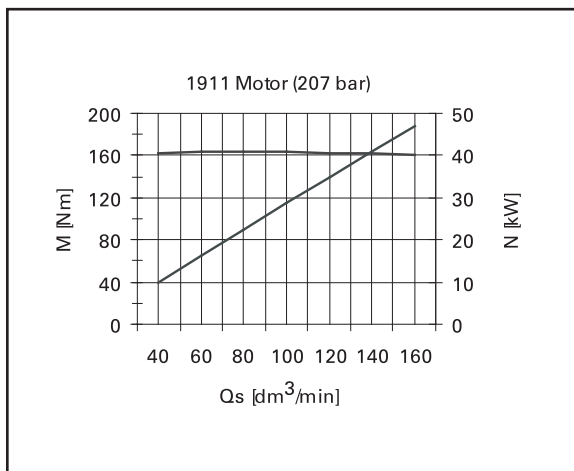
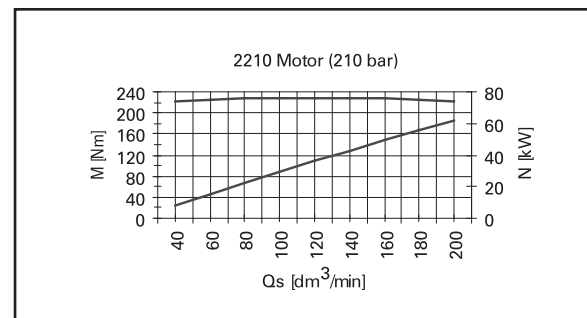
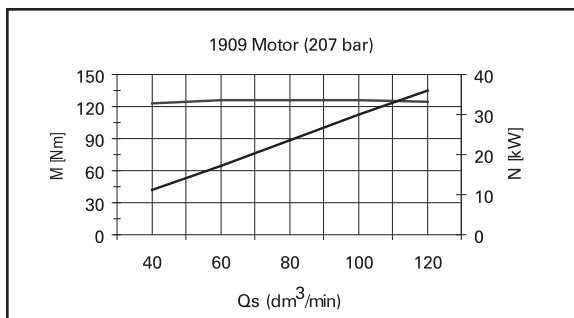
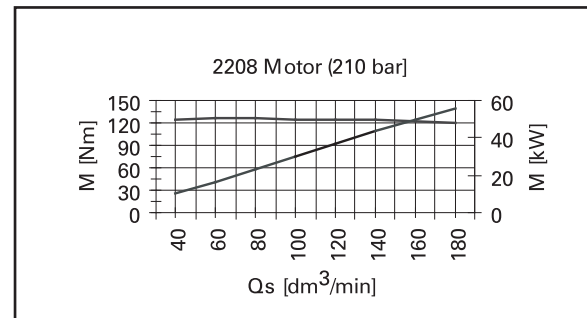
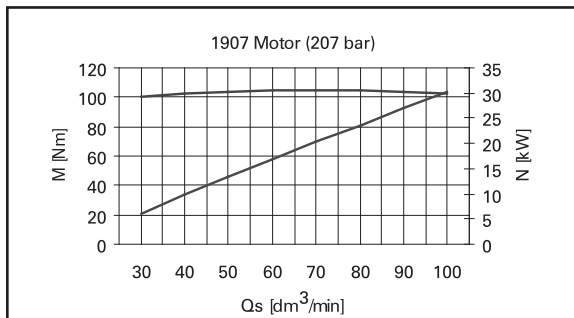
2100 SERIES



GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

MOTOR CHARACTERISTICS



1900 SERIES

2200 SERIES



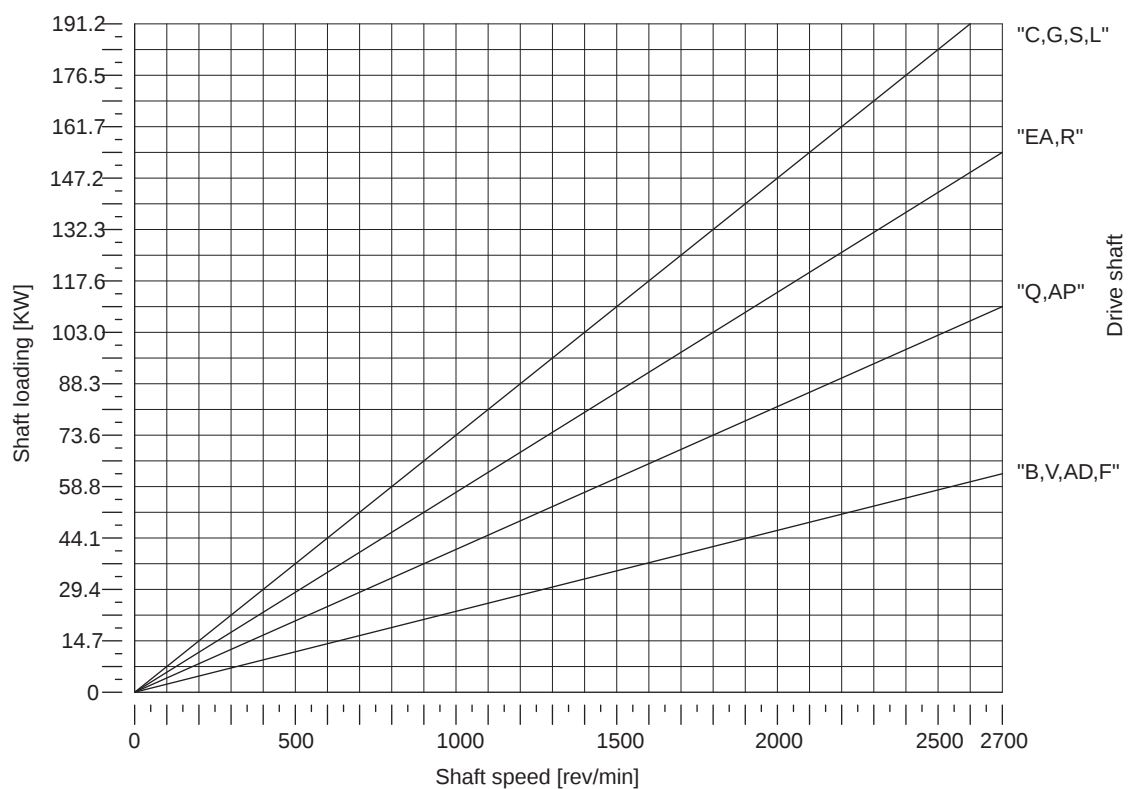
WARYŃSKI HYDRAULIKA

GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

DRIVE SHAFT

POWER LIMITATIONS



1900/2200 series

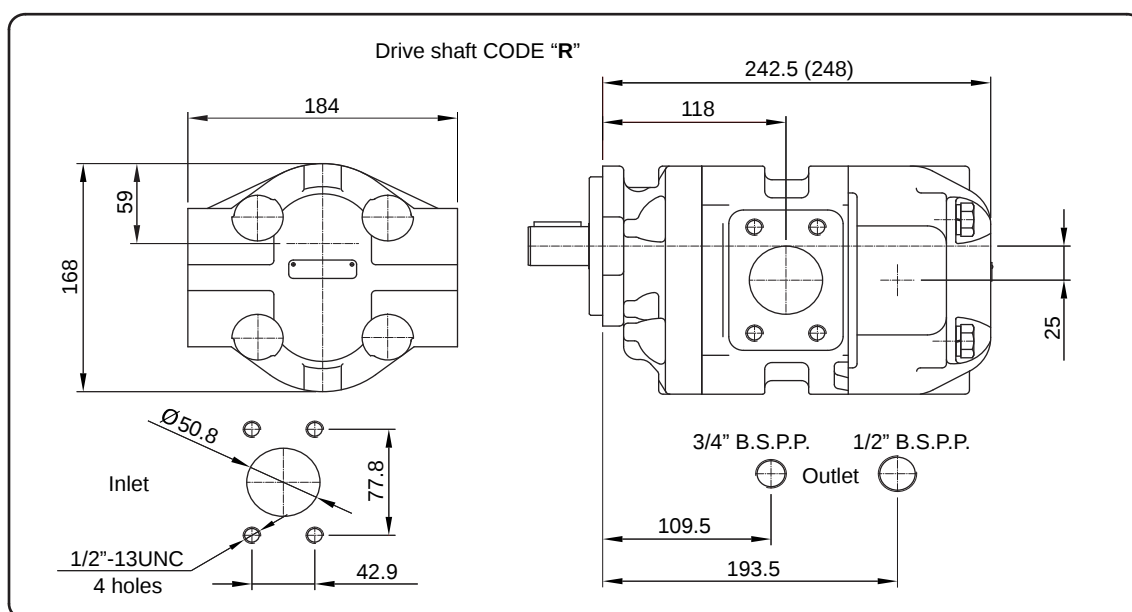
COMMON INLET

GEAR PUMPS AND MOTORS

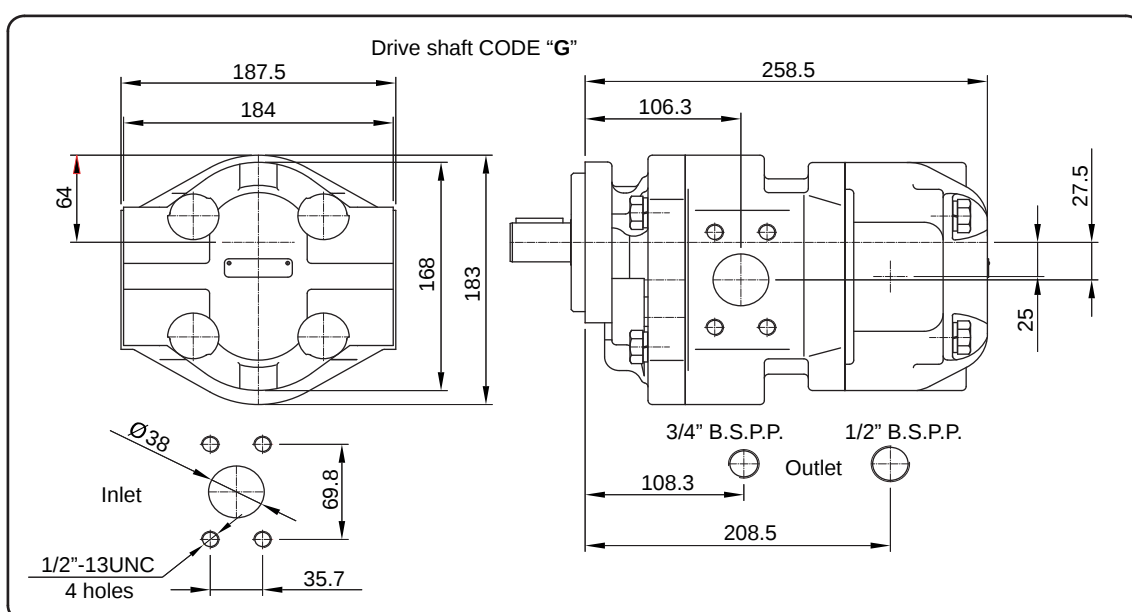
WARYNSKI SERIES



GEAR PUMP SIZE 1907/05, 1909/07



GEAR PUMP SIZE 2207/1906, 2207/1905



Applied in JCB Machines

* First number- Dimensions of size 1907/05,2207/1906

Second number- Dimensions of size 1909/07,2207/1905

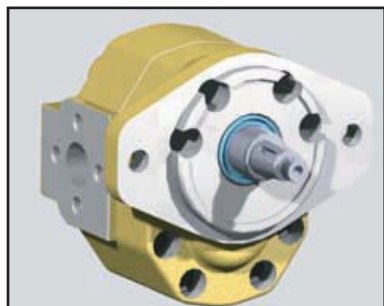


WARYŃSKI HYDRAULIKA

GROUP 3

DATA

GEAR PUMPS WARYNSKI SERIES

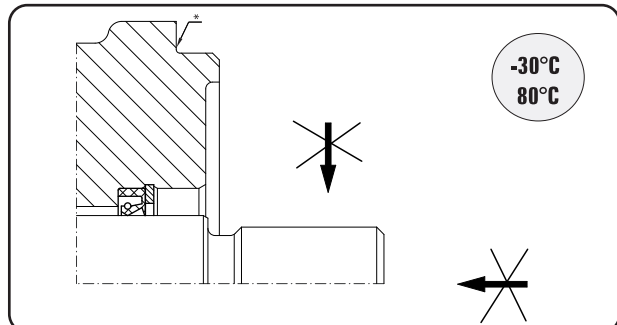


Model	Px3-15	Px3-20	Px3-25	Px3-35	Px3-40	Px3-46	Px3-55	Px3-64
Displacement [ccm/rev]	15,0	20,0	26,4	34,9	39,9	45,8	54,9	64,1
Rated pressure [MPa]	25							23
Max speed [rpm]	2700							

x- seal design

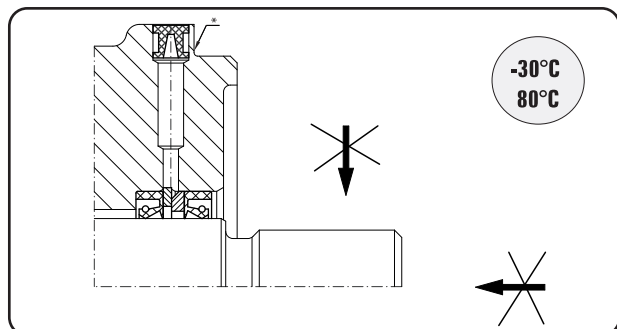
● Dimensions data ● Drive shaft ● Mounting flange ● Ports

SEAL DESIGN / HOW TO ORDER



code A

Suitable for external drives and flexible coupling



code C

Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes

TYPE	DRIVE SHAFTS	FLANGE	PORTS	Rotation A- anticlockwise C- clockwise
Px3-20	C	9	ES	C
Px3-15	AT B Q ES AX F	2 9 11 13	ES GS B26 B2	A C
Px3-20				
Px3-25				
Px3-35				
Px3-40				
Px3-46				
Px3-55				
Px3-64				

x- seal design

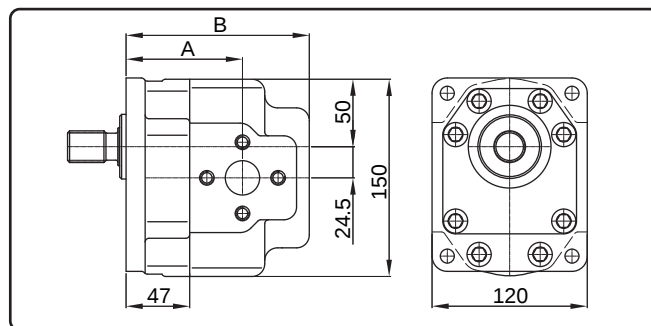


WARYŃSKI HYDRAULIKA

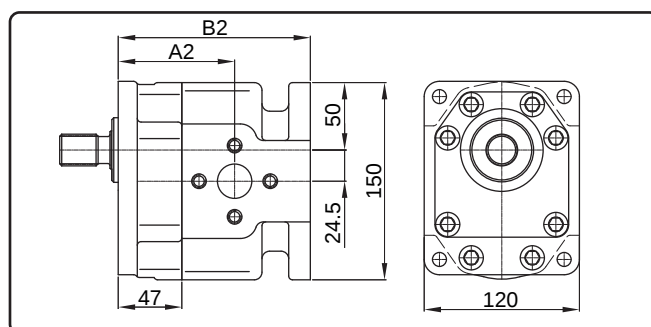
GROUP 3

DIMENSIONS DATA

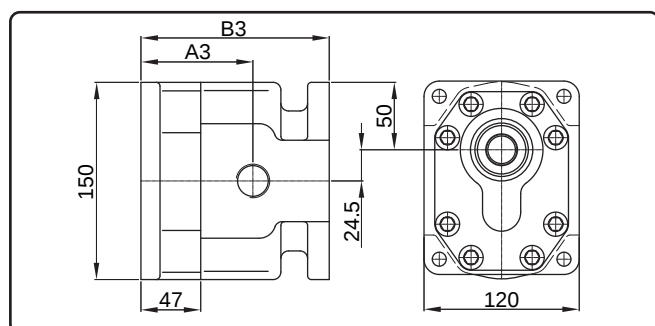
GEAR PUMPS WARYNSKI SERIES



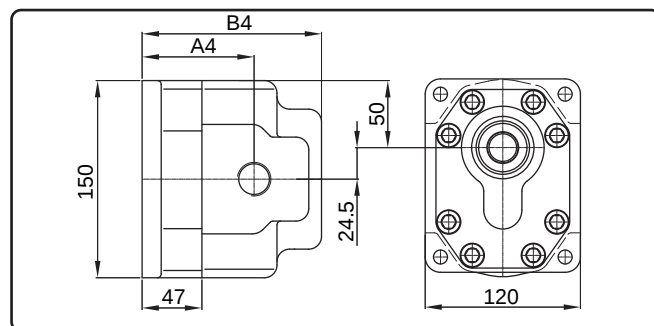
Single unit



Multiple: front unit



Multiple: intermediate unit



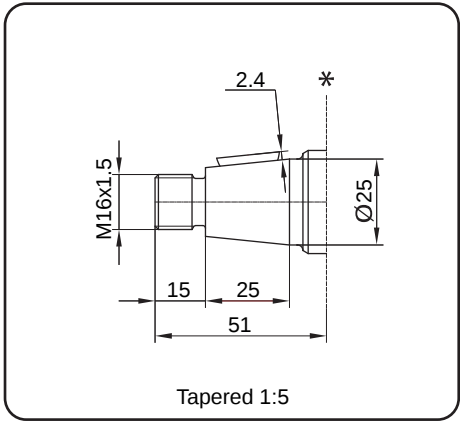
Multiple: rear unit

SIZE	A1*	B1	WEIGHT [kg]	A2*	B2	WEIGHT [kg]	A3*	B3	WEIGHT [kg]	A4*	B4	WEIGHT [kg]
PA3-15	85	122	10,5	83	131	10,7	82	128	10,7	82	121	10,5
PA3-20	88	127	10,8	88	134	11	85	131	11	85	124	10,8
PA3-26		132	11,2		139	11,4		136	11,4		129	11,2
PA3-35		135	11,4		142	11,7		139	11,7		132	11,4
PA3-40	88/91,5	138,5	11,7	88/91,5	145,5	12		142,5	12		135,5	11,7
PA3-46		144	12,2		151	12,4		148	12,4		141	12,2
PA3-55		149,5	12,7		156,5	12,9		153,5	12,9		146,5	12,7
PA3-64	95/98			95/98								

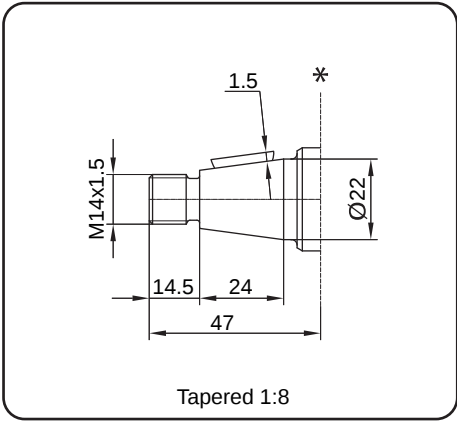
* First number - dimensions for threaded ports
Second number - dimensions for flanged ports



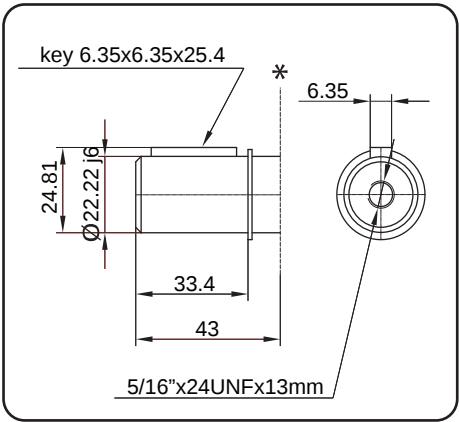
SHAFTS WITH KEY



code ES

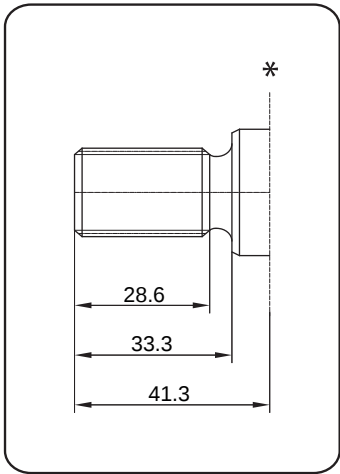


code FS



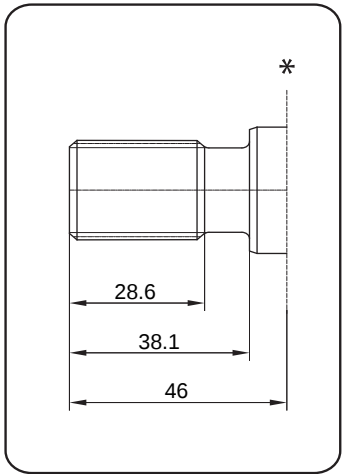
code F

INVOLUTE SPLINE SHAFTS



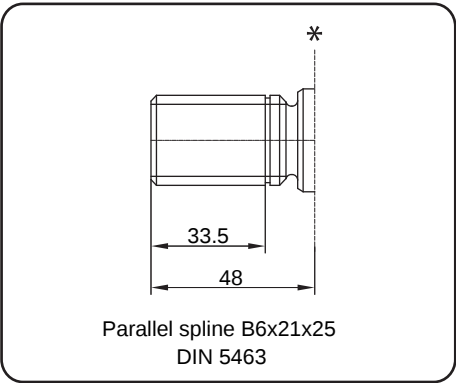
code B

	code B	code Q
size	SAE B 7/8"	SAE BB 1"
side fit	Flat root	Flat root
diametral pitch	16/32	16/32
pressure angle	30°	30°
number of teeth	13	15
major diameter	21,79/ 21,69	24,97/ 24,87



code Q

PARALLEL SPLINE SHAFTS



Parallel spline B6x21x25
DIN 5463

code AT

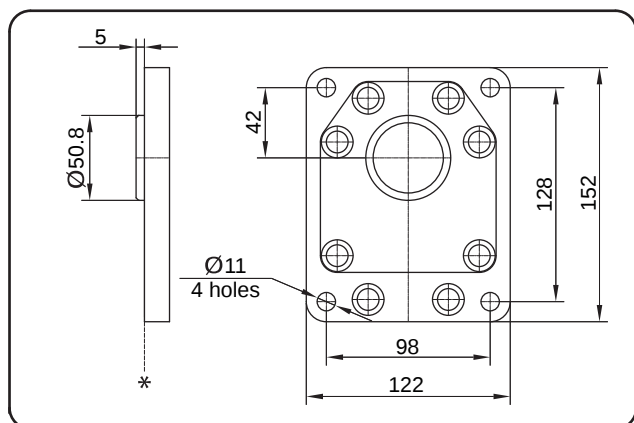
* standard flange mounting surface

GROUP 3

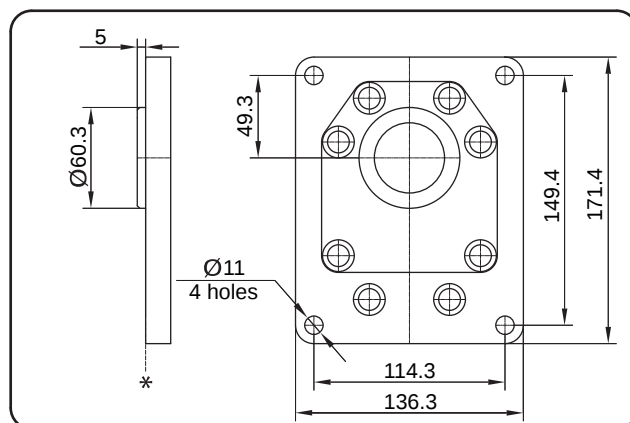
MOUNTING FLANGES

GEAR PUMPS

WARYNSKI SERIES

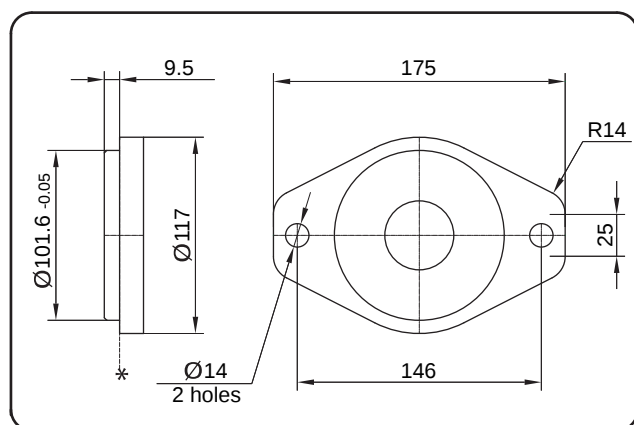


code 9

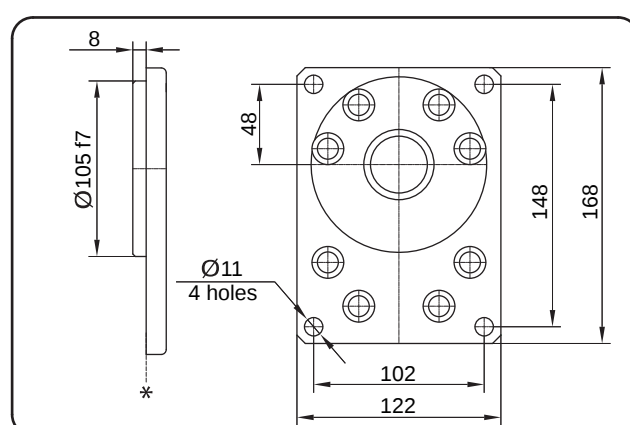


code 11

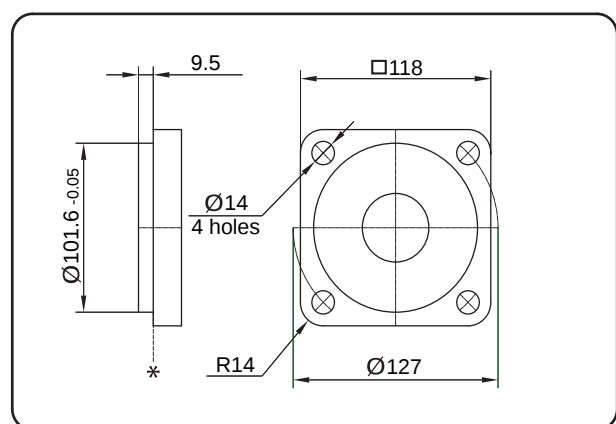
SAE B



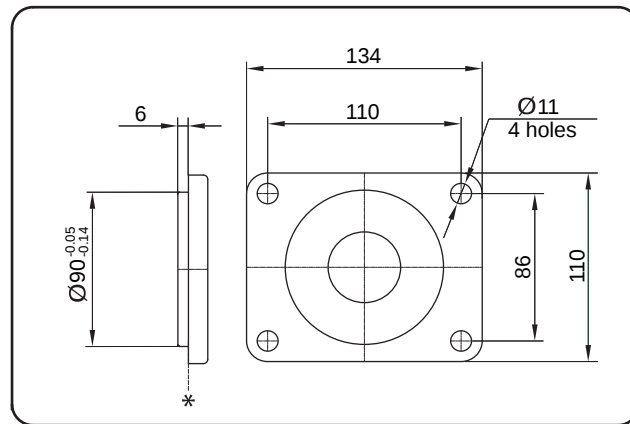
code 2



code 13



code 3



code 41

* standard flange mounting surface

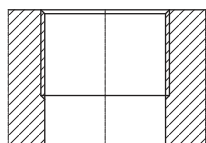


GROUP 3

PORTS

GEAR PUMPS

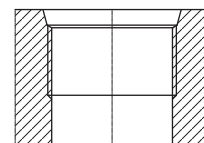
WARYNSKI SERIES



G21, G22, G32, G33

SIZE	INLET	OUTLET	CODE PORTS
20,26,35,40	3/4"B.S.P.P	3/4"B.S.P.P	G22
46,55,64	1"B.S.P.P	1"B.S.P.P	G33
20,26,35	3/4"B.S.P.P	1/2"B.S.P.P	G21
40,46,55,64	1"B.S.P.P	3/4"B.S.P.P	G32
20,26,35,40	M33x2 O-Ring	M33x2 O-Ring	C23
46,55,64	M42x2 O-Ring	M33x2 O-Ring	

O-RING



C23

SAE STANDARD

SIZE	PUMPS													
	INLET							OUTLET						
	B2		B2/B26			B26		B2		B2/B26			B26	
	M	h	A	B	C	M	h	M	h	A	B	C	M	h
15	3/8-16 UNC	17	26,2	52,4	25	M10	17	3/8-16 UNC	17	22,2	47,6	19	M10	17
20														
26														
35														
40														
46	7/16-14 UNC	17	30,2	58,7	31	M10	17	7/16 UNC	17	26,2	52,4	25	M10	17
55														
64	1/2 UNC		35,7	69,8	38	M12		7/16 UNC		30,2	58,7	31	M12	

EUROPEAN STANDARD

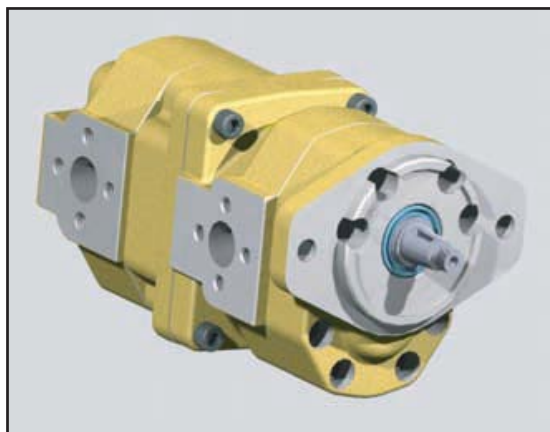
SIZE	PUMPS								CODE
	INLET				OUTLET				
	A	C	M	h	A	C	M	h	
15	51	27	M10	17	40	19	M8	17	ES
20									
26									
35									
40									
46									
55									
64	62	33	M12		51	20	M10		

GERMAN STANDARD

SIZE	PUMPS								CODE
	INLET				OUTLET				
	A	C	M	h	A	C	M	h	
15	55	27	M8	17	55	19	M8	17	GS
20									
26									
35									
40									
46									
55									
64									



MULTIPLE PUMPS



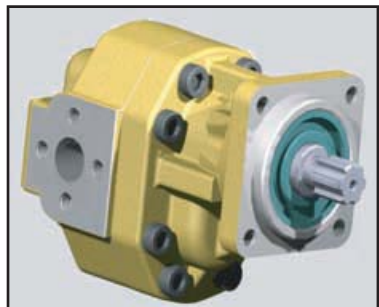
- Seal design
- Dimensions data
- Drive shaft
- Mounting flange
- Ports

HOW TO ORDER

P-PUMP	SEAL DESIGN	TYPE			DRIVE SHAFTS	FLANGES	PORTS			Rotation A- anticlockwise C- clockwise D- birotation
		First section	Second section	Third section			First section	Second section	Third section	
P	A	3-55	3-26	3-15	AT	9	C23	C23	C23	C
P	A C AJ* CJ*	3-15	3-15	3-15	AT	2 9 11 13	ES	ES	ES	A C
		3-20	3-20	3-20	B		GS	GS	GS	
		3-26	3-26	3-26	Q		C51	C51	C51	
		3-35	3-35	3-35	ES		C52	C52	C52	
		3-40	3-40	3-40	FS		C91	C91	C91	
		3-46	3-46	3-46	F		C23	C23	C23	
		3-55	3-55	3-55						
		3-64	3-64	3-64						

*x - A standard drive shaft seal

*AJ, CJ - common inlet



Model	Px3-15	Px3-20	Px3-25	Px3-35	Px3-40	Px3-46	Px3-55	Px3-64
Displacement [ccm/rev]	15,0	20,0	26,4	34,9	39,9	45,8	54,9	64,1
Rated pressure [MPa]	25							23
Max speed [rpm]	2700							

x- A standard performance
- E performance with bearing



Dimensions 1



Dimensions 2

HOW TO ORDER

PUMP	SEAL DESIGN	TYPE	DRIVE SHAFTS	FLANGES	PORTS	Rotation A- anticlockwise C- clockwise
P	E	3-20	BT	10	ES	C
P	A* E*	3-15	BT PR	10 12	ES GS	A C
		3-20				
		3-26				
		3-35				
		3-40				
		3-46				
		3-55				
		3-64				

*x- A standard performance
*- E performance with bearing

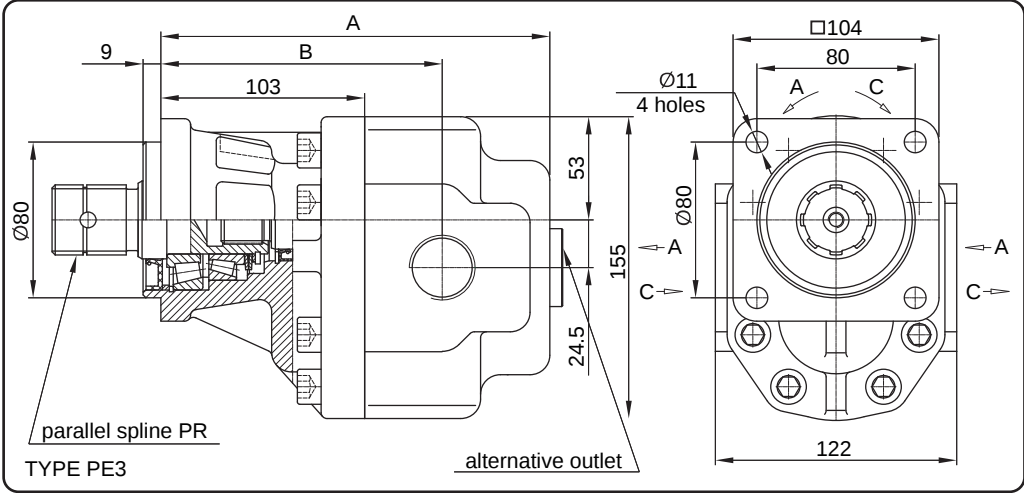
GROUP PTO 4 HOLES

DATA

GEAR PUMPS

WARYNSKI SERIES

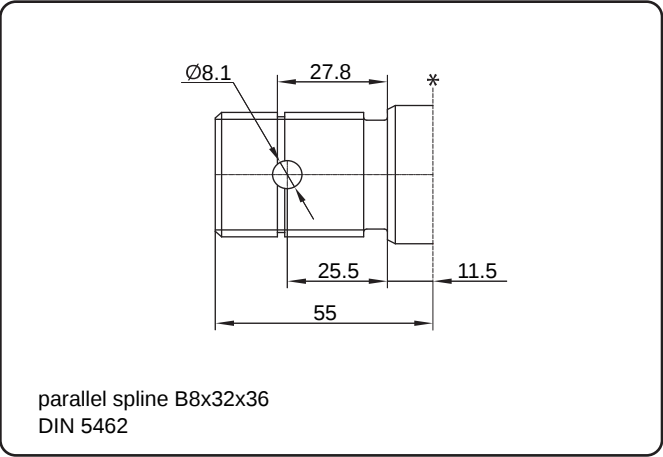
DIMENSIONS DATA



SIZE	A	B*	WEIGHT [kg]
PE3-15	177	138	12,5
PE3-20	180	141	12,8
PE3-26			
PE3-35	185		13,2
PE3-40	188		13,4
PE3-46	191,5	141/144,5*	13,8
PE3-55	197		14,3
PE3-64	202,5	148/151*	14,8

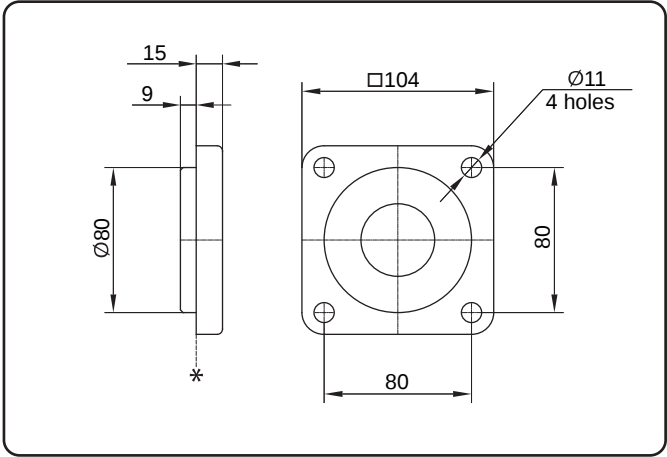
* FIRST NUMBER - dimensions for threaded ports
SECOND NUMBER- dimensions for flanged ports

DRIVE SHAFTS

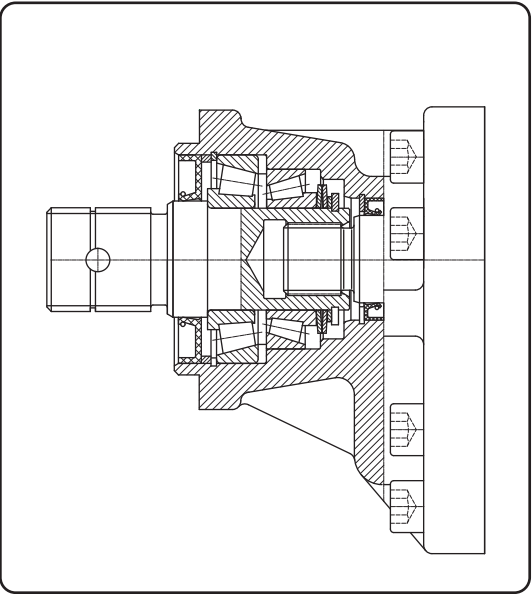


code PR

MOUNTING FLANGE

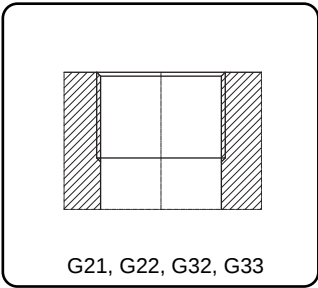


code 10



code E

SEAL DESIGN

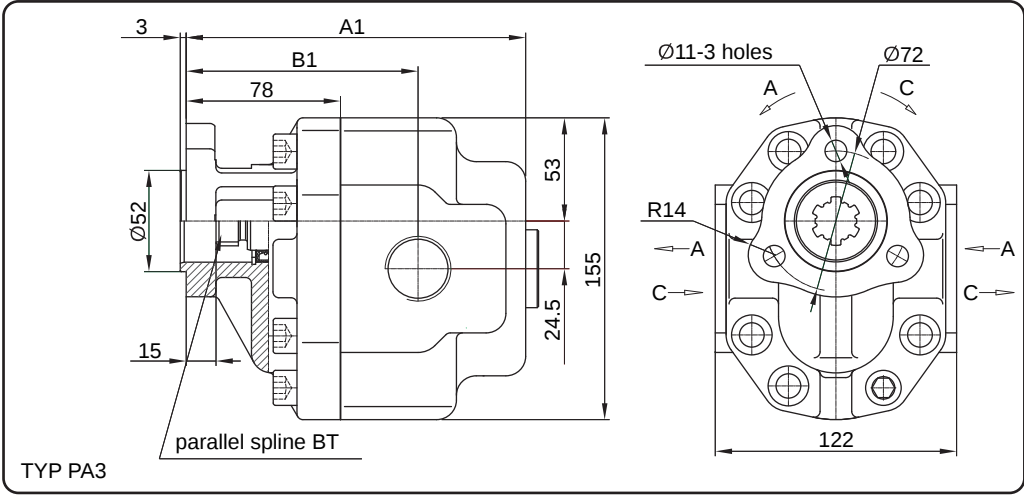


PORTS

TYPE	INLET	OUTLET	CODE PORTS
20,26,35,40	3/4"B.S.P.P	3/4"B.S.P.P	G22
46,55,64	1"B.S.P.P	1"B.S.P.P	G33
20,26,35	3/4"B.S.P.P	1/2"B.S.P.P	G21
40,46,55,64	1"B.S.P.P	3/4"B.S.P.P	G32

* standard flange mounting surface

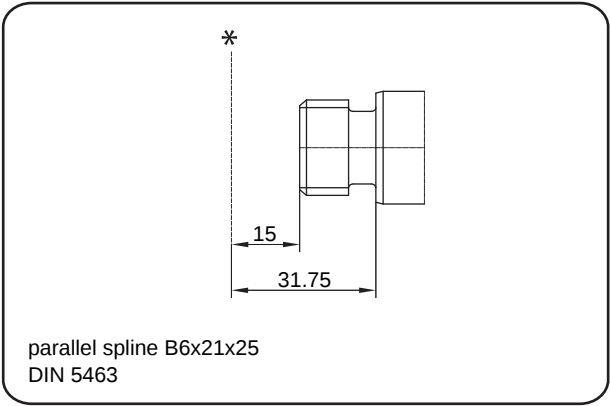
DIMENSIONS DATA



SIZE	A	B*	WEIGHT [kg]
PE3-15	177	138	12,5
PE3-20	180	141	12,8
PE3-26			
PE3-35	185		13,2
PE3-40	188		13,4
PE3-46	191,5	141/144,5*	13,8
PE3-55	197		14,3
PE3-64	202,5	148/151*	14,8

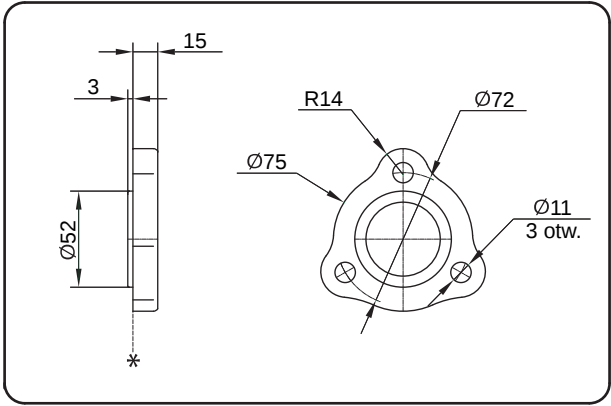
* FIRST NUMBER - dimensions for threaded ports
SECOND NUMBER- dimensions for flanged ports

DRIVE SHAFTS



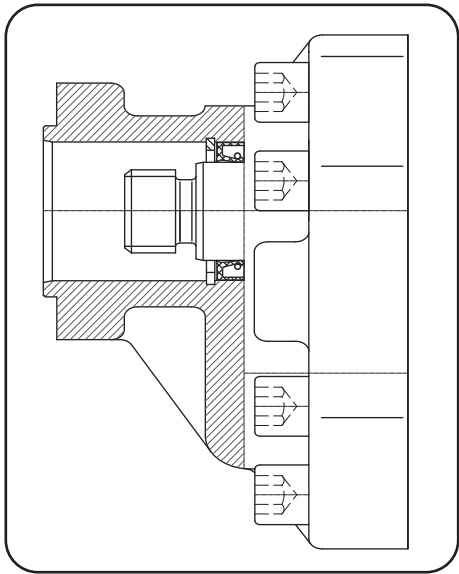
code PR

MOUNTING FLANGE



code 10

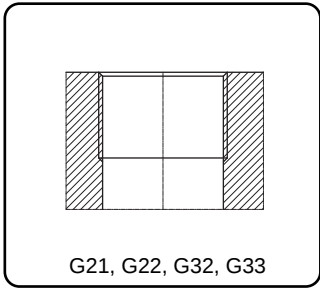
SEAL DESIGN



code E

* standard flange mounting surface

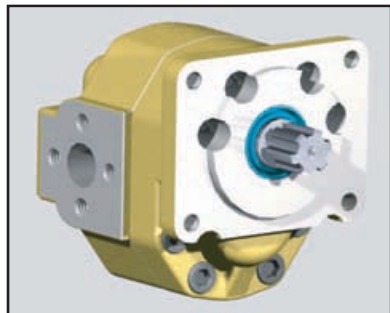
PORTS



G21, G22, G32, G33

TYPE	INLET	OUTLET	CODE PORTS
20,26,35,40	3/4"B.S.P.P	3/4"B.S.P.P	G22
46,55,64	1"B.S.P.P	1"B.S.P.P	G33
20,26,35	3/4"B.S.P.P	1/2"B.S.P.P	G21
40,46,55,64	1"B.S.P.P	3/4"B.S.P.P	G32

INTERCHANGEABLE TO NSZ 32, 40, 50



Model	P2A1907AT41B27	P2A1909AT41B27	P2A1911AT41B27	PC2413AT41B27
Displacement [ccm/rev]	32	40	50	100
Rated pressure [MPa]	25			21
Max speed [rpm]	2700			

● Dimensions 1

● Dimensions 2

HOW TO ORDER

We offer models:

P2A1907AT41B27A/C

substitute of NSZ 32

P2A1909AT41B27A/C

substitute of NSZ 40

P2A1911AT41B27A/C

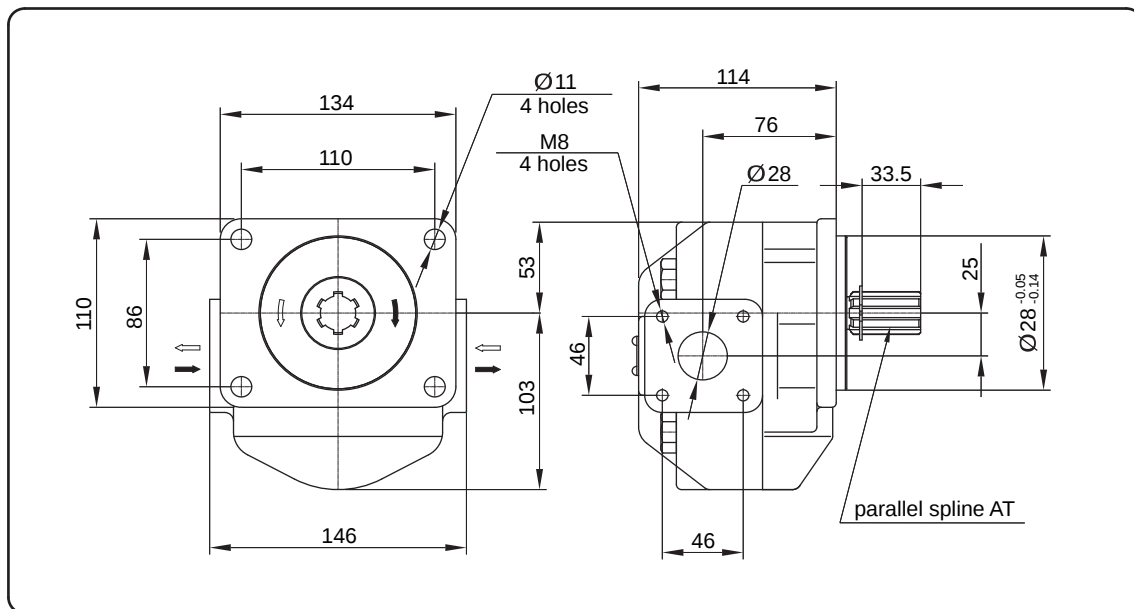
substitute of NSZ 50

PC2413AT41B27A/C

substitute of NSZ 100

PUMP P2A 1907 AT41B27A/C

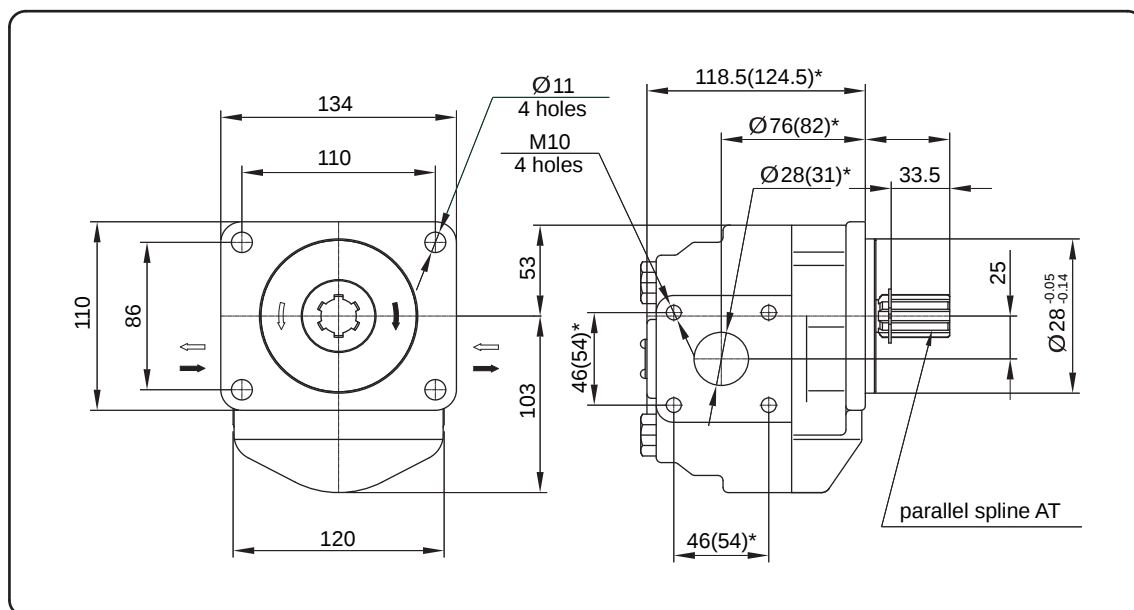
INTERCHANGEABLE TO NSZ 32 UNITS



PUMP P2A 1909 AT41B27A/C

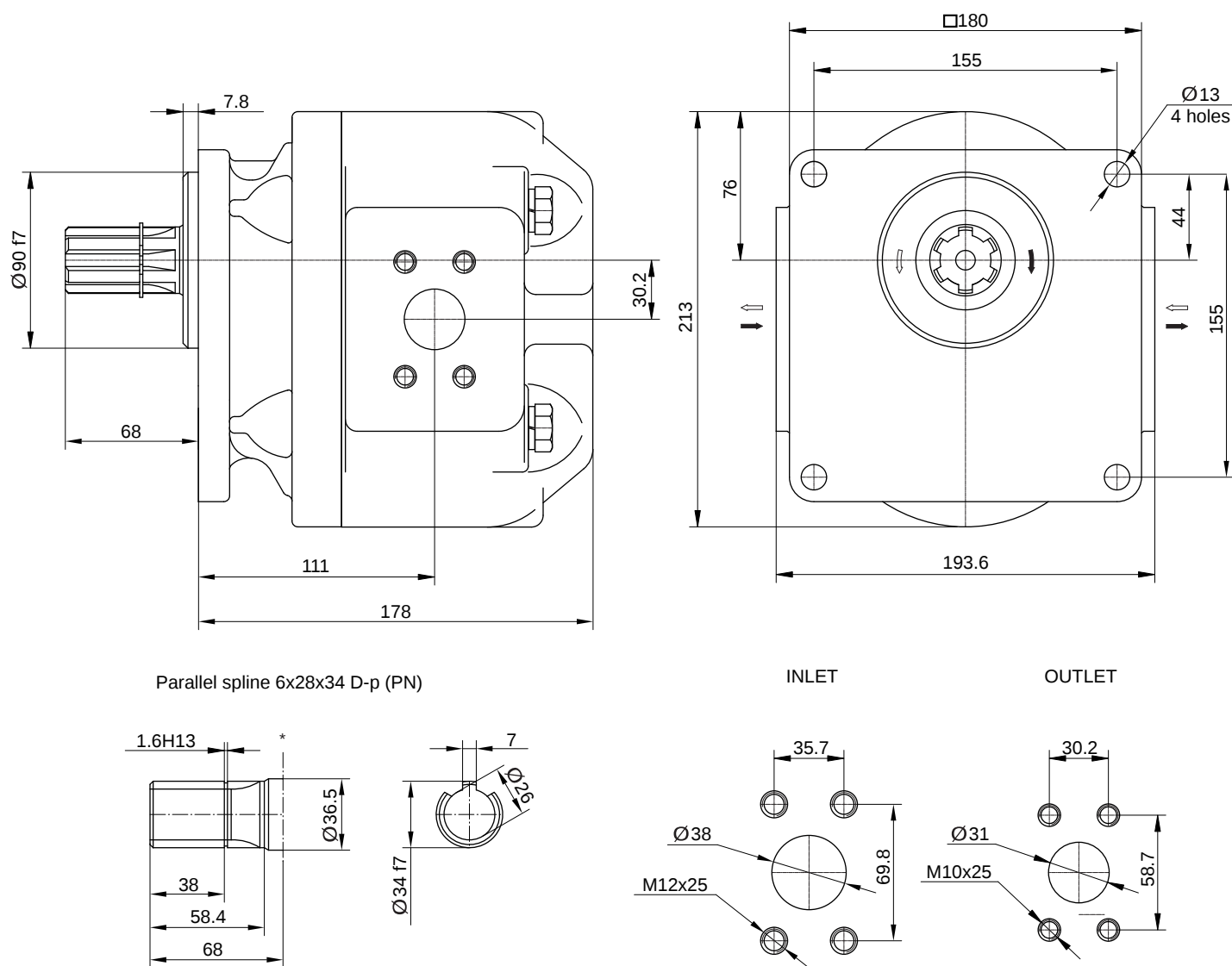
PUMP P2A 1911 AT41B27A/C

INTERCHANGEABLE TO NSZ 40, NSZ 50 UNITS



* First number - dimensions of size 1909
Second number - dimensions of size 1911

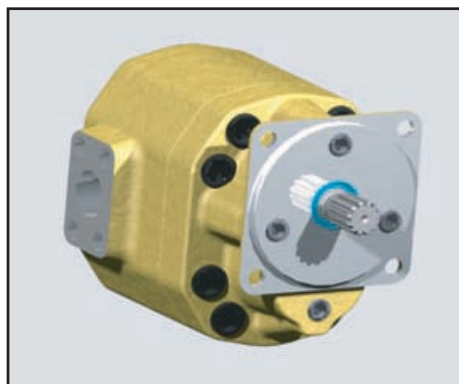
PUMP PA 2413 ATC42B26A/C



GROUP 32

DATA

GEAR PUMPS WARYNSKI SERIES



Model	32045	32055	32063	32072	32085	32100
Displacement [ccm/rev]	45	55	63	72	85	100
Rated pressure [MPa]	25					21
Max speed [rpm]	3000					

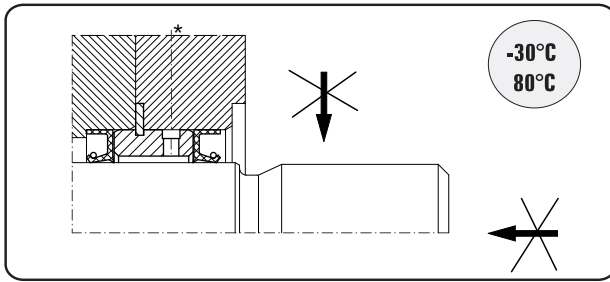
● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

HOW TO ORDER

PUMP	SEAL DESIGN	GROUP	DISPLACEMENT [ccm/rev.]	DRIVE SHAFTS	FLANGES	PORTS	Rotation A- anticlockwise C- clockwise
W	C	32	055	C	5	A1	C
W	A C	32	045	C G	2 3 4 5	A1 B26	A C
			063				
			055				
			072				
			085				
			100				



SEAL DESIGN



code A, C

CODE A

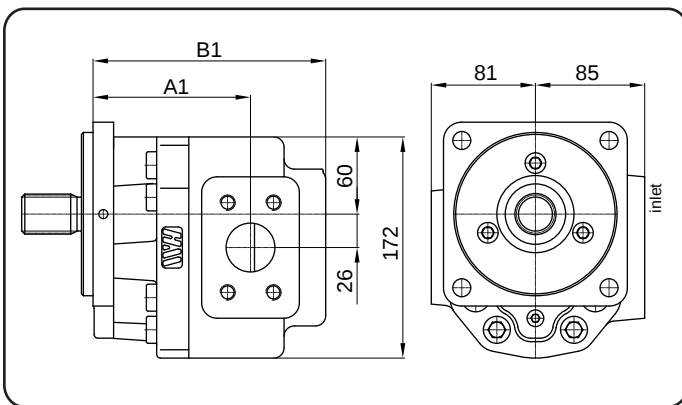
Suitable for external drives and flexible coupling

CODE C

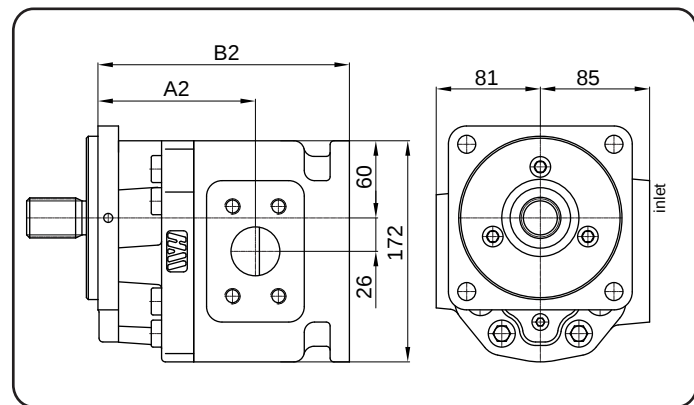
Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes

* leakage port

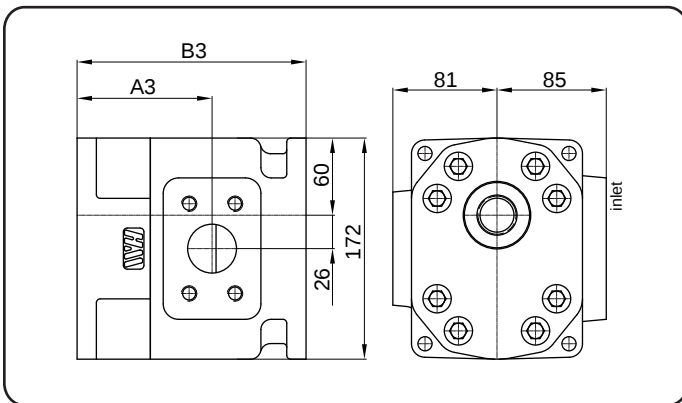
DIMENSIONS DATA



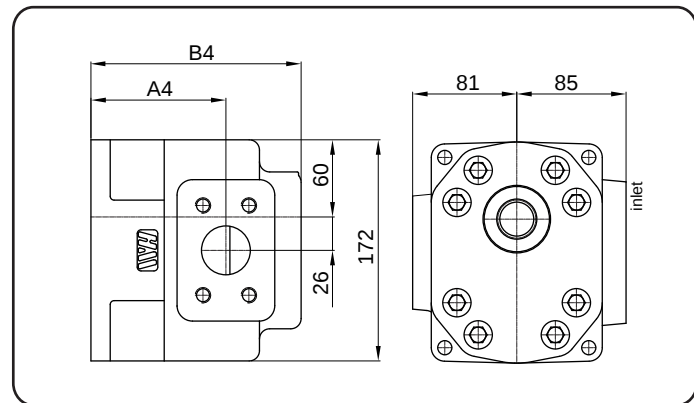
Single unit



Front unit



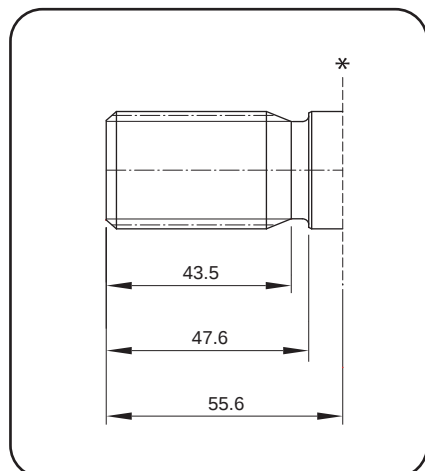
Intermediate unit



Rear unit

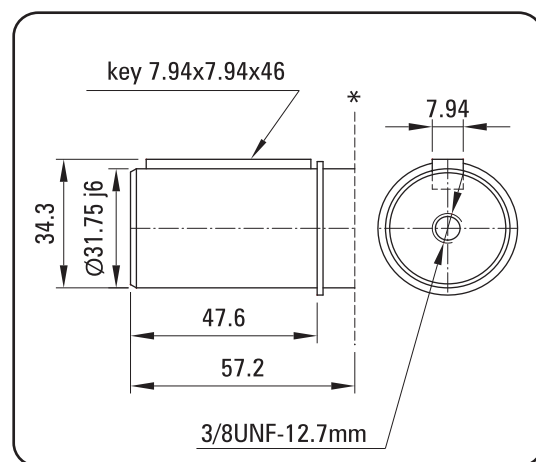
MODEL	Single unit		Front unit		Intermediate unit		Rear unit	
	A1	B1	A2	B2	A3	B3	A4	B4
32045	118	176,5	118	191	100,5	173,5	100,5	159
32055	118	176,5	118	191	100,5	173,5	100,5	159
32063	122,5	181	122,5	195,5	105	178	105	163,5
32072	127,5	186	127,5	200,5	110	183	110	168,5
32085	134	192,5	134	207	116,5	189,5	116,5	175
32100	143	201,5	143	216	125,5	198,5	125,5	184

DRIVE SHAFTS



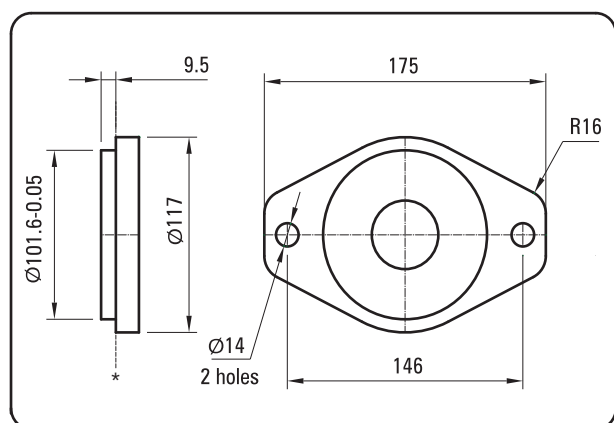
involute spline	SAE C
side fit	1.250"
diametral pitch	12/24
pressure angle	30 °
number of teeth	14
major diameter	31,20/ 31,12

code C



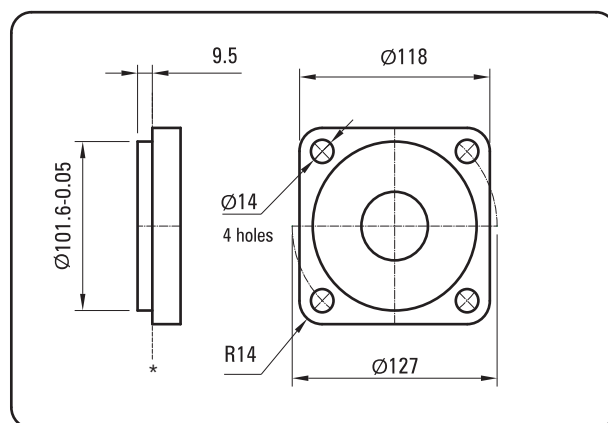
code G

MOUNTING FLANGES



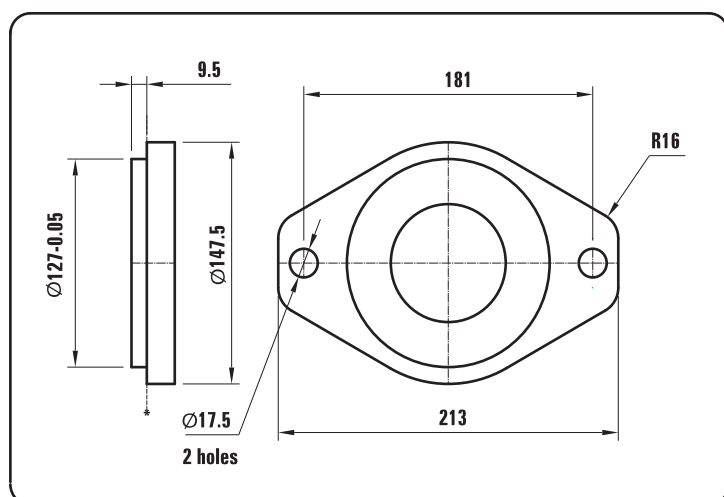
code 2

SAE B

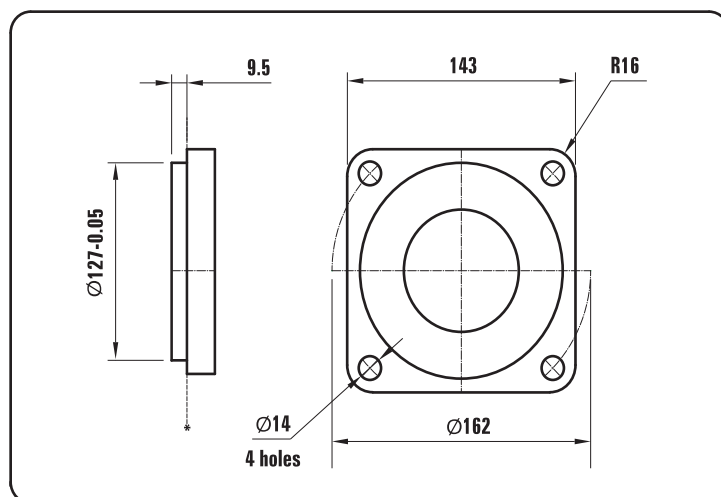


code 3

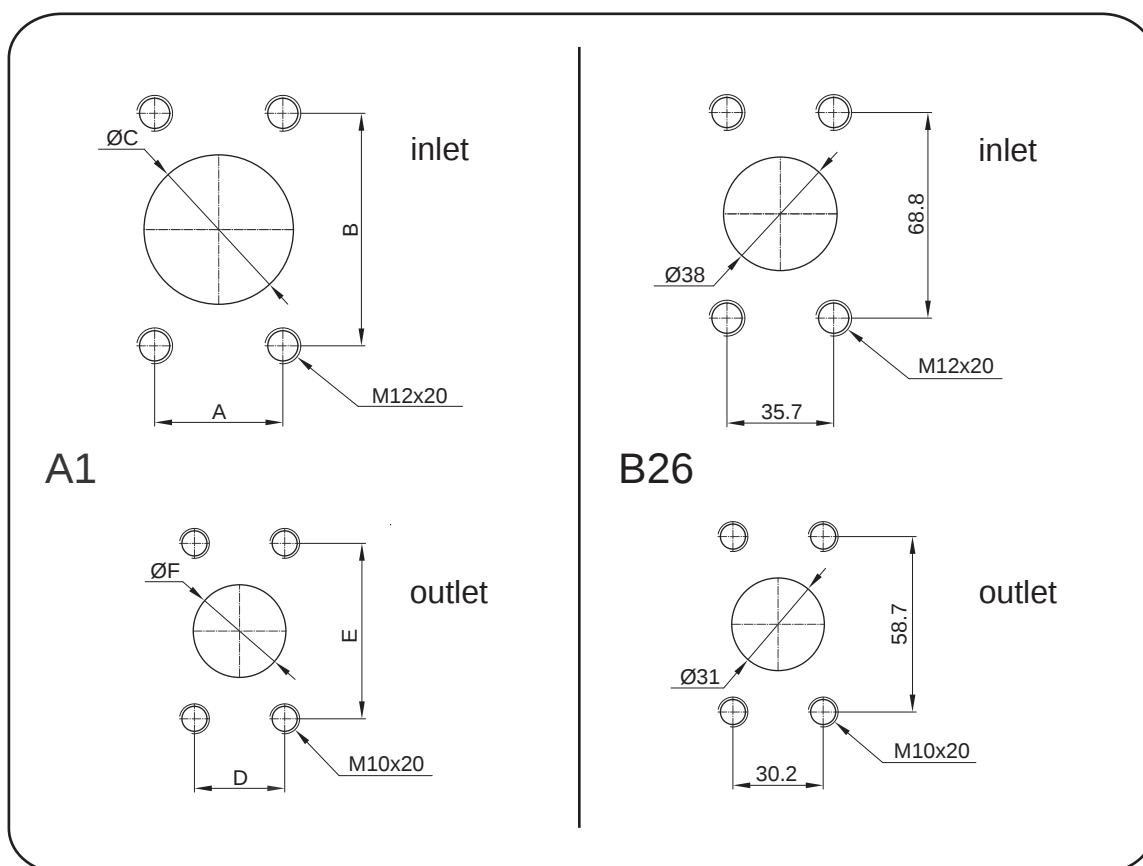
SAE C



code 4



code 5

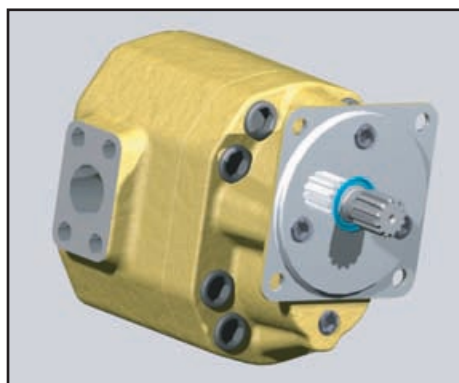


SERIES	INLET: A1			OUTLET: A1		
	A	B	C	D	E	F
32045	69,8	35,7	38	30,2	52,4	31
32055	69,8	35,7	38	30,2	52,4	31
32063	69,8	35,7	38	30,2	52,4	31
32072	69,8	35,7	38	30,2	58,7	31
32085	69,8	35,7	38	30,2	58,7	31
32100	69,8	35,7	38	30,2	58,7	31

GROUP 40

DATA

GEAR PUMPS WARYNSKI SERIES



Model	40100	40118	40137	40155	40176	40200
Displacement [ccm/rev]	100	118	137	155	176	200
Rated pressure [Mpa]	25	25	25	25	21	20

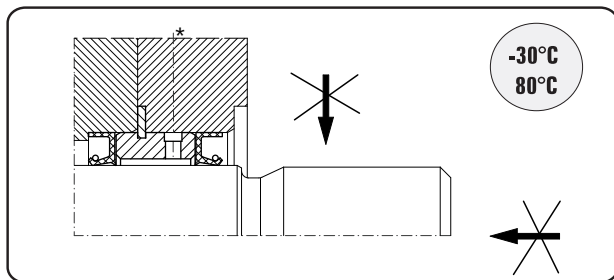
● Seal design
● Dimensions data
● Drive shaft
● Mounting flange
● Ports

HOW TO ORDER

PUMP	SEAL DESIGN	GROUP	DISPLACEMENT [ccm/rev.]	DRIVE SHAFTS	FLANGES	PORTS	Rotation A- anticlockwise C- clockwise
W	C	40	100	C	5	A1	C
W	A C	40	100	C G	4 5	A1 B26	A C
			118				
			137				
			155				
			176				
			200				



SEAL DESIGN



code A, C

CODE A

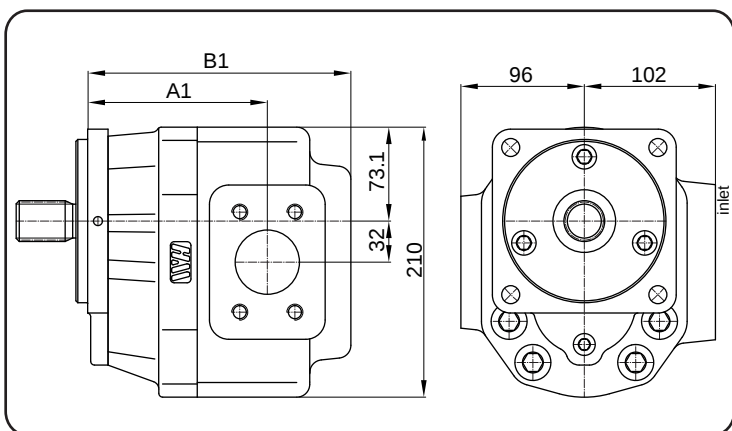
Suitable for external drives and flexible coupling

CODE C

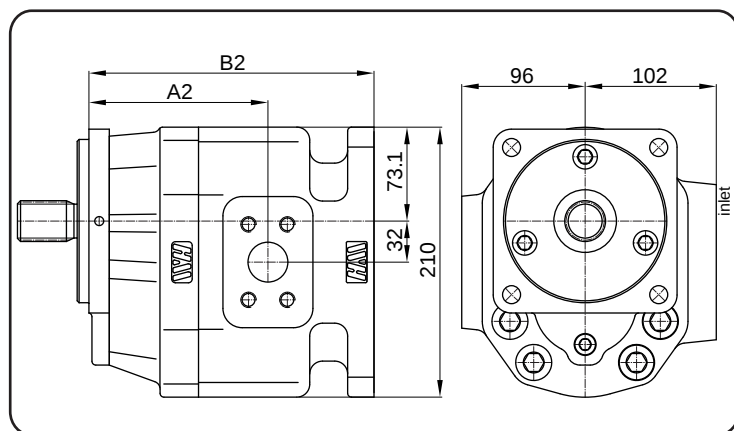
Visible-bleed drilling suitable for drives with no load for direct mounting on torque converters and gear boxes

* leakage port

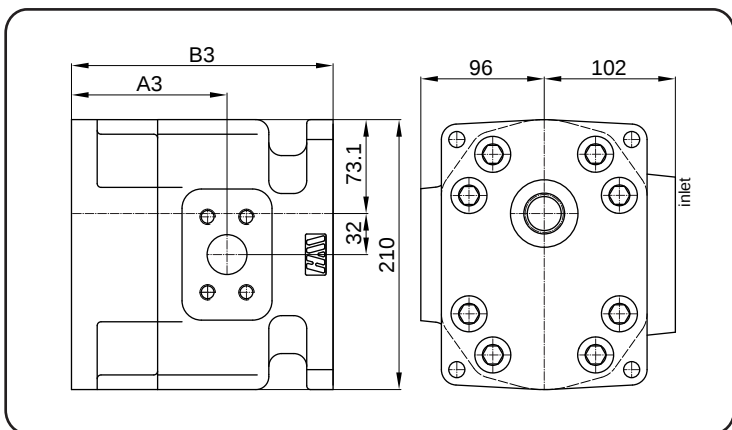
DIMENSIONS DATA



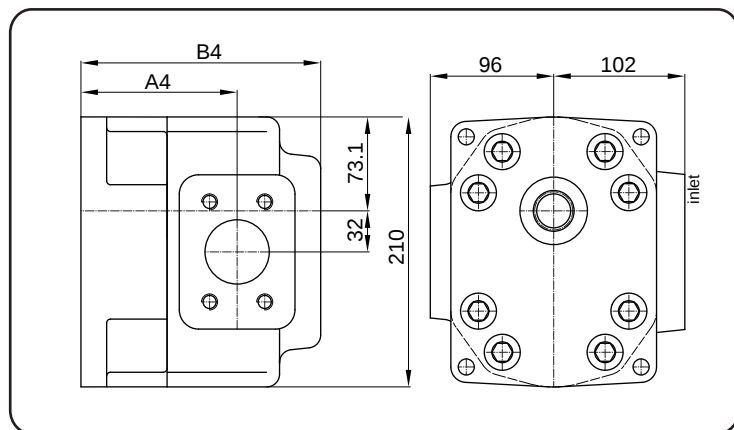
Single unit



Front unit



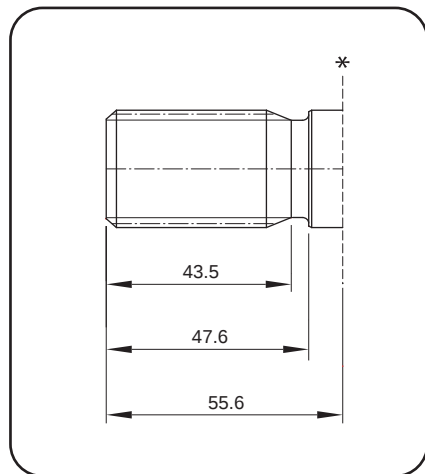
Intermediate unit



Rear unit

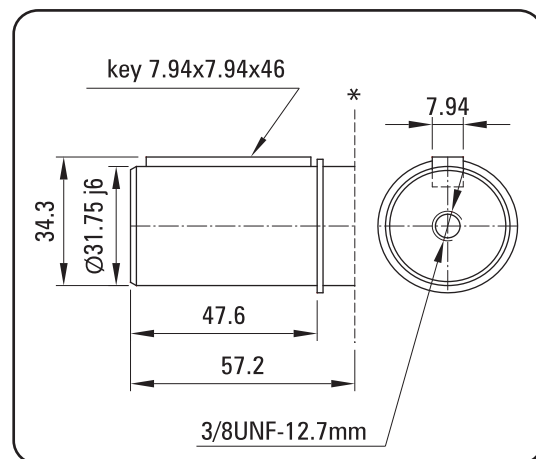
MODEL	Single unit		Front unit		Intermediate unit		Rear unit	
	A1	B1	A2	B2	A3	B3	A4	B4
40100	139	204,5	139,5	221,5	121,5	203,5	121	186,5
40118	146	211,5	146,5	228,5	128,5	210,5	128	193,5
40137	152,5	217,5	153,5	235,5	135	217	134,5	199,5
40155	139	223,5	139,5	241,5	121	223,5	121	205,5
40176	146,5	231,5	146,5	249,5	128,5	231	128,5	213
40200	155	239,5	155,5	257,5	137	239,5	137	221,5

DRIVE SHAFTS



involute spilne	SAE C
side fit	1.250"
diametral pitch	12/24
pressure angle	30 °
number of teeth	14
major diameter	31,20/ 31,12

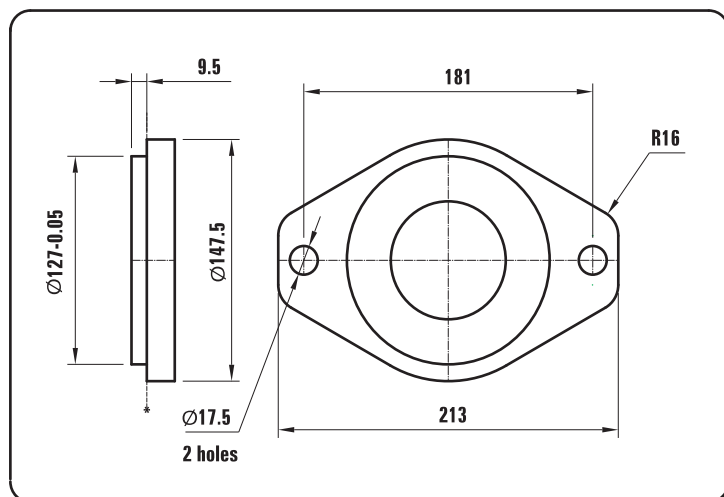
code C



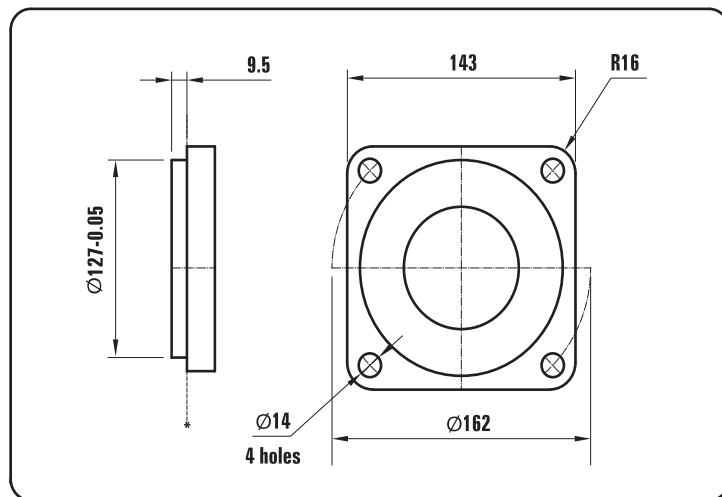
code G

MOUNTING FLANGES

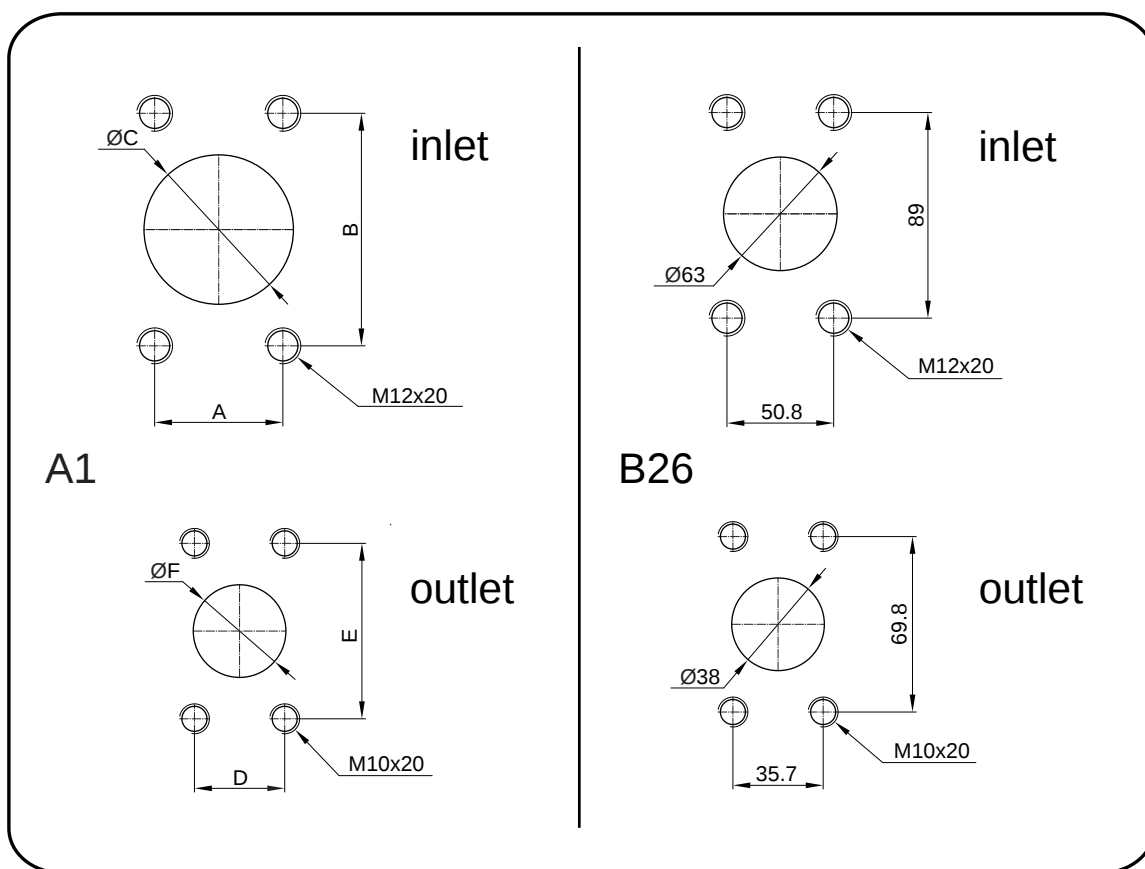
SAE C



code 4



code 5



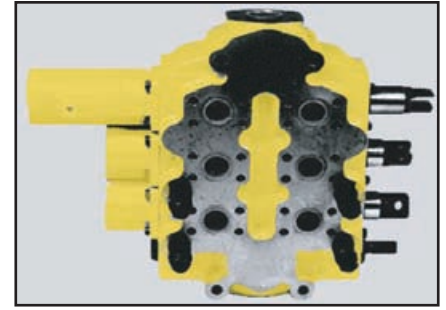
SERIES	INLET: A1			OUTLET: A1		
	A	B	C	D	E	F
40100	35,7	69,8	38	30,2	58,7	31
40118	42,8	77,8	50	30,2	58,7	31
40137	42,8	77,8	50	30,2	58,7	31
40155	42,8	77,8	50	30,2	58,7	31
40176	50,8	89,0	63	35,7	69,8	38
40200	50,8	89,0	63	35,7	69,8	38

DIRECTIONAL CONTROL VALVES

HAMWORTHY SERIES



1106 4 spools



1013 3 spools

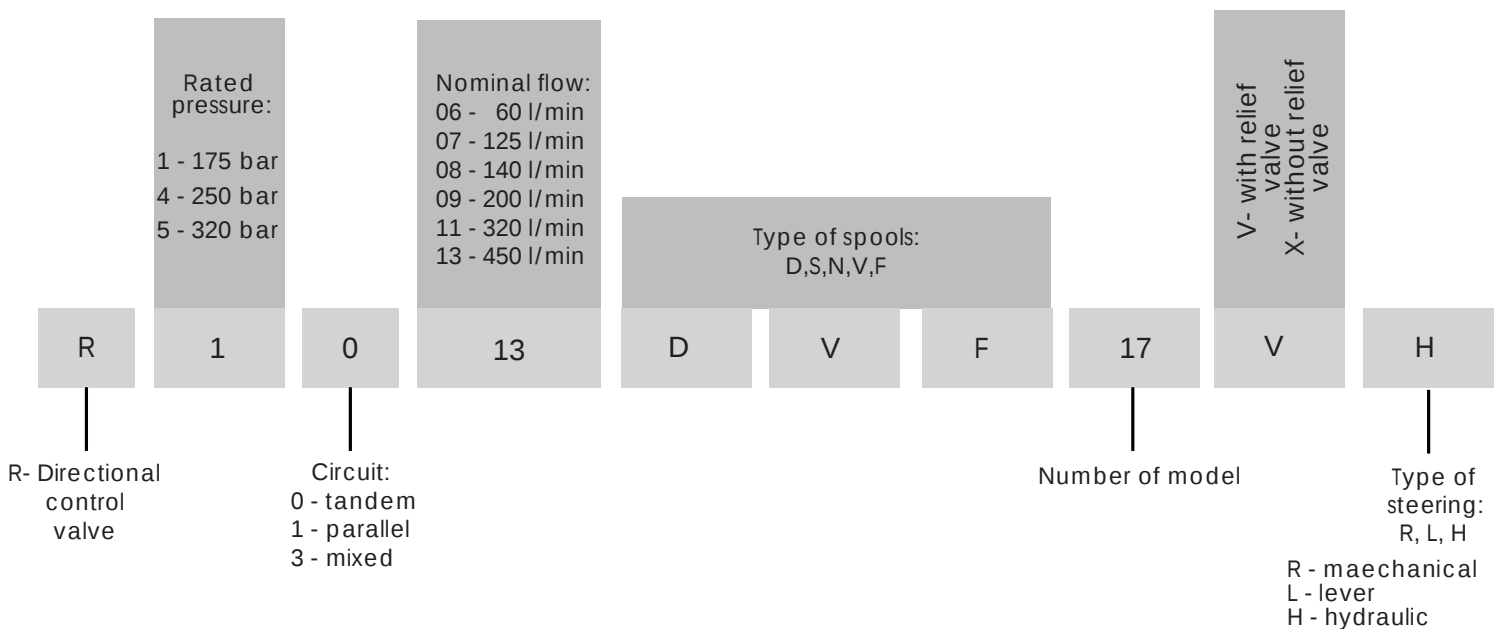
324

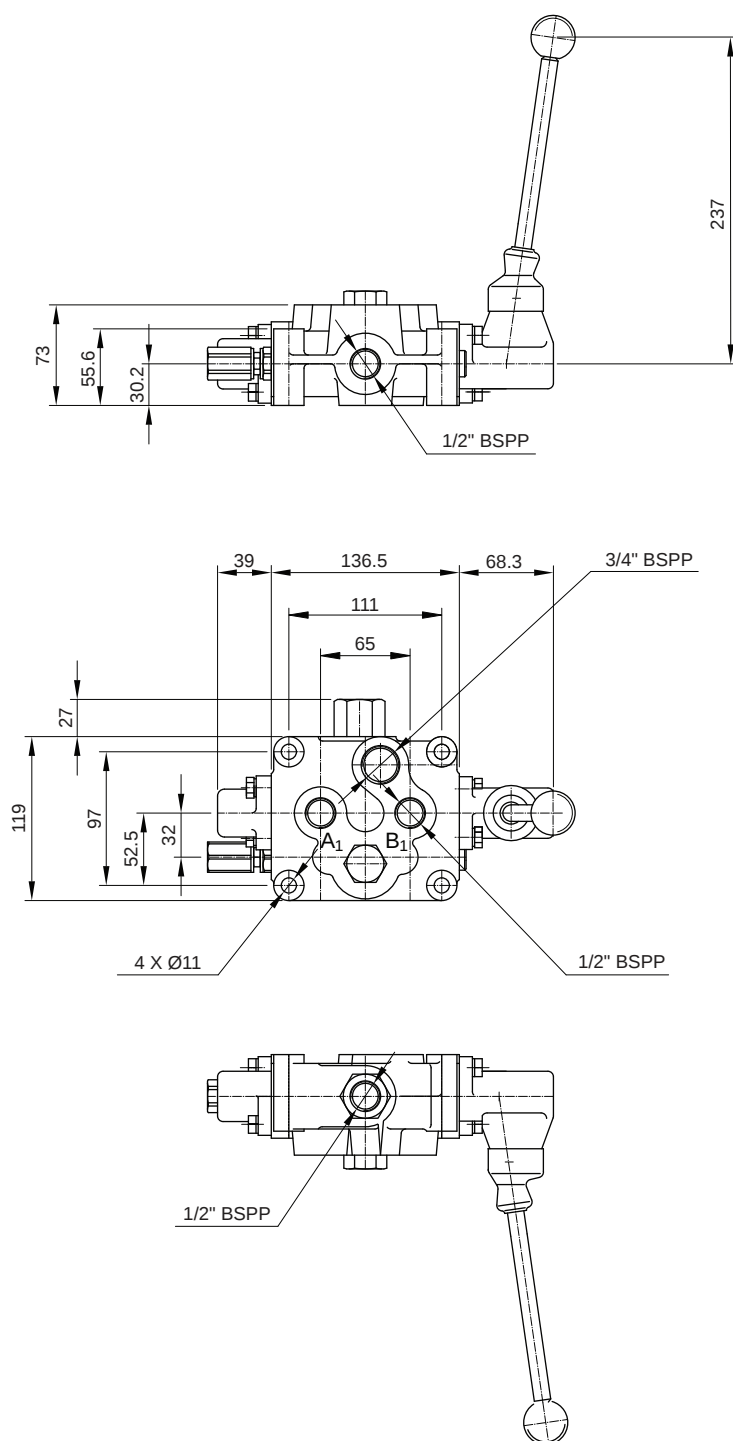
	Tandem circuit					Parallel circuit			Mixed circuit	
Rated pressure* up to 17,5 MPa	1006	1007	1009	1011	1013	1106	1107	1109	1308	1011
Rated pressure* up to 25 MPa	X	4007	4009	4011	4013	X	4107	4109	4308	5311**
Rated flow [dm ³ /min]	63	125	200	320	320	63	125	200	140	200
Number of spools	1	1,2	1	2,3	2,3	2,3,4	2,3 4,6	2,3	4	4

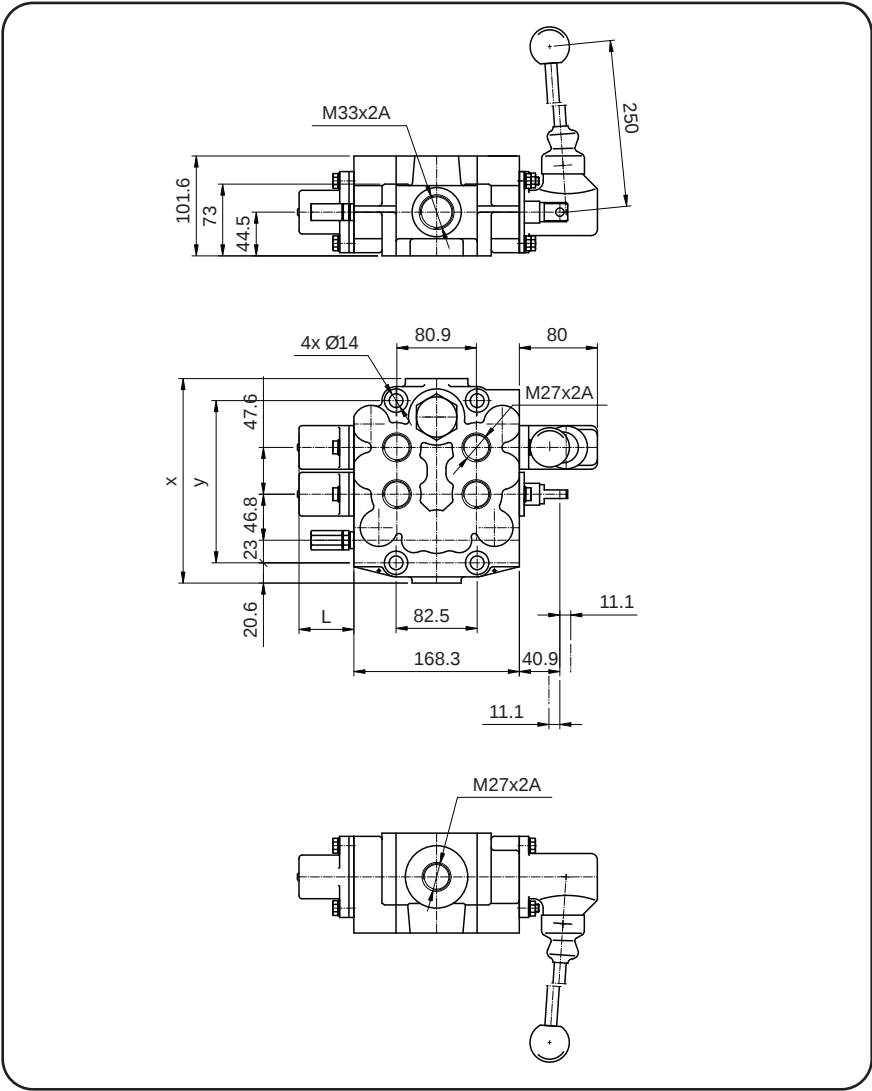
* Nominal flow selection

** Up to 32 MPa

DIRECTIONAL CONTROL VALVES / HOW TO ORDER

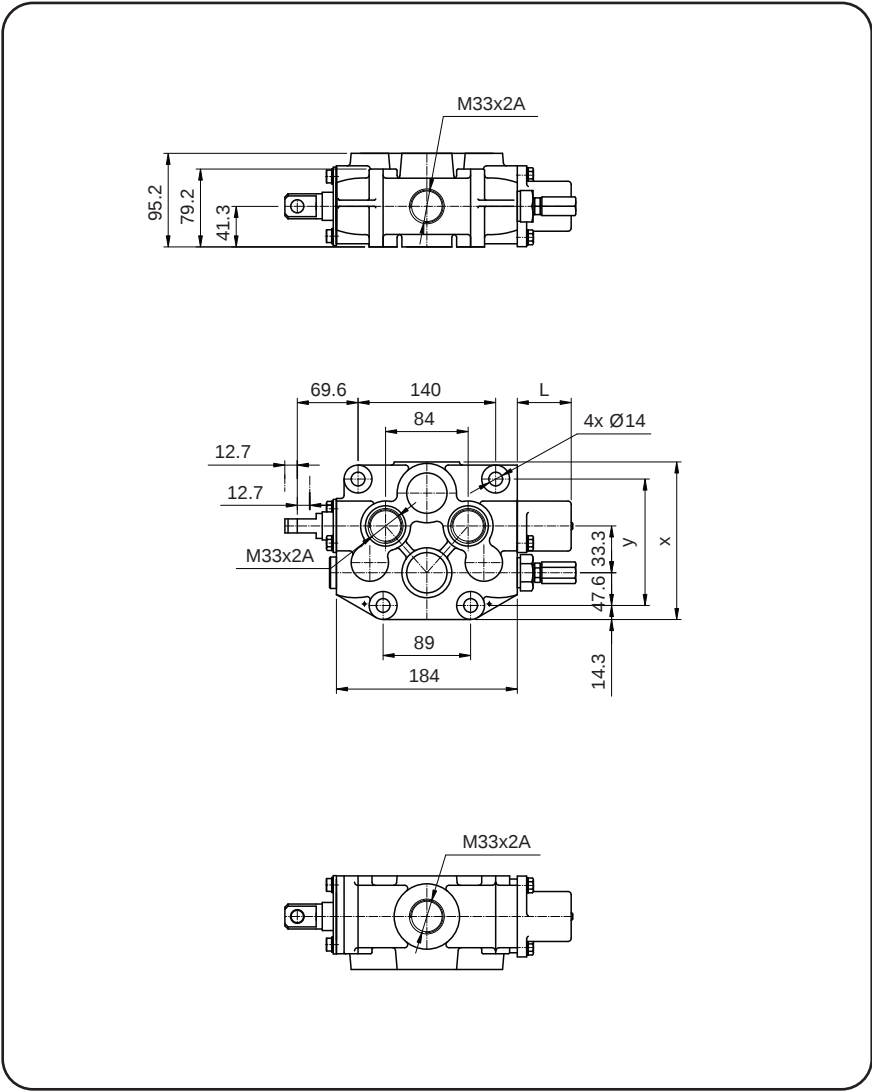






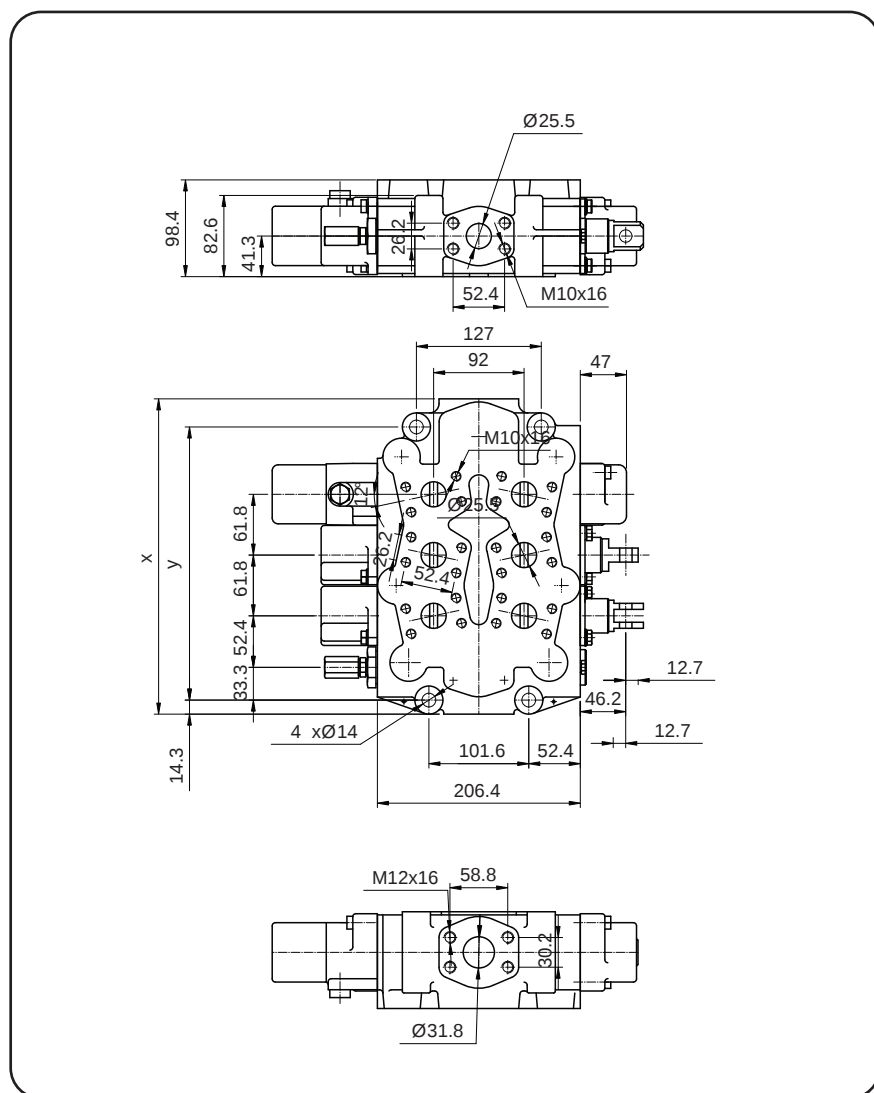
Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1007	1	160.4	117.4	9.0
R4007	2	208.0	165.0	12.0

Centring and detent systems								Hydraulic operation
Type	A	B	C	D	F	G	J	H
L [mm]	56	152	152	105	152	152	152	90



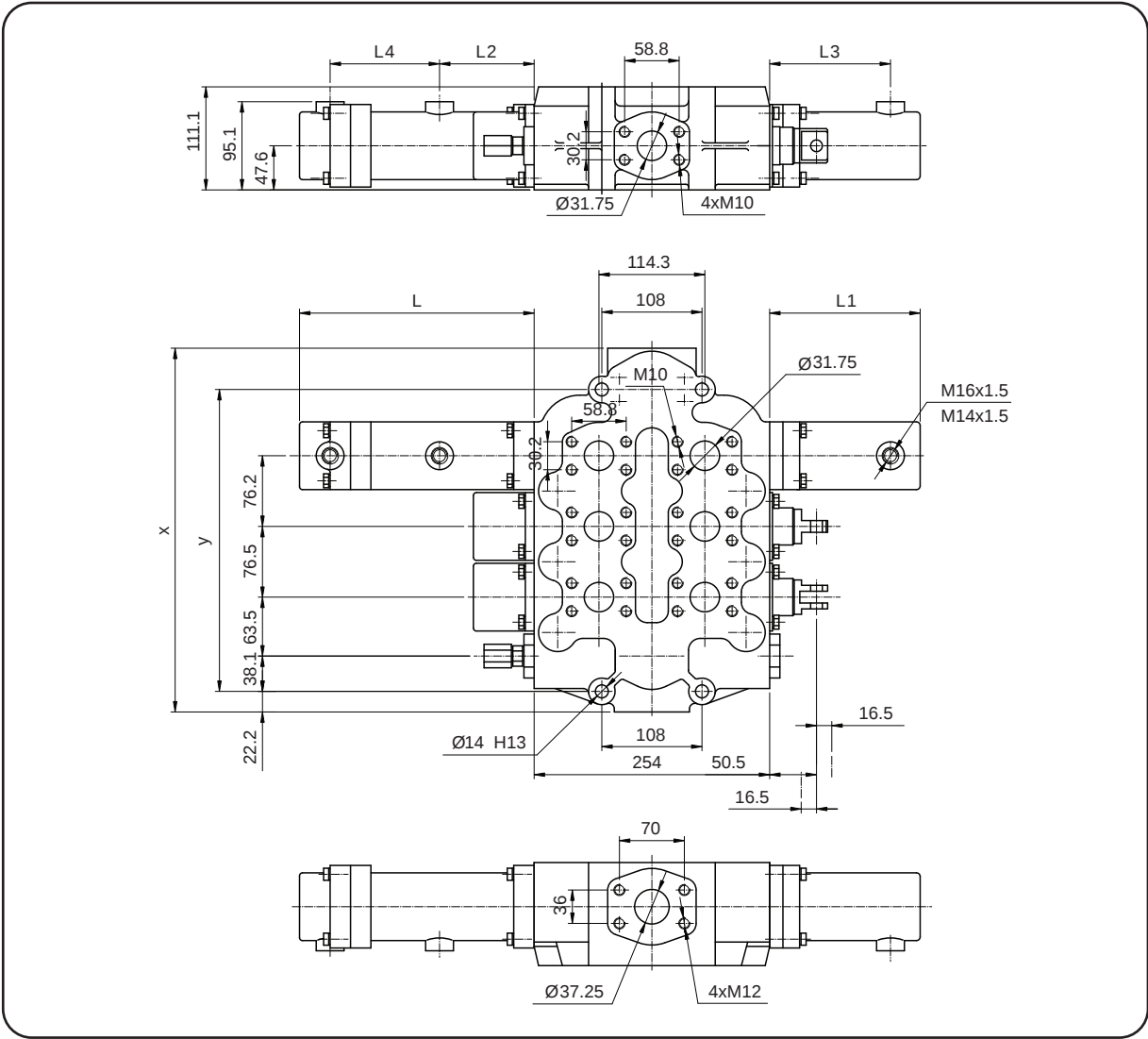
Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1009	1	160.3	128.6	12.0
R4009				

Centring and detent systems								Hydraulic operation
Type	A	B	C	D	F	G	J	H
L [mm]	45	125	125	125	125	125	125	100



Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1011	2	258.7	215.9	22.0
	3	320.7	277.8	30.0

[illegible]



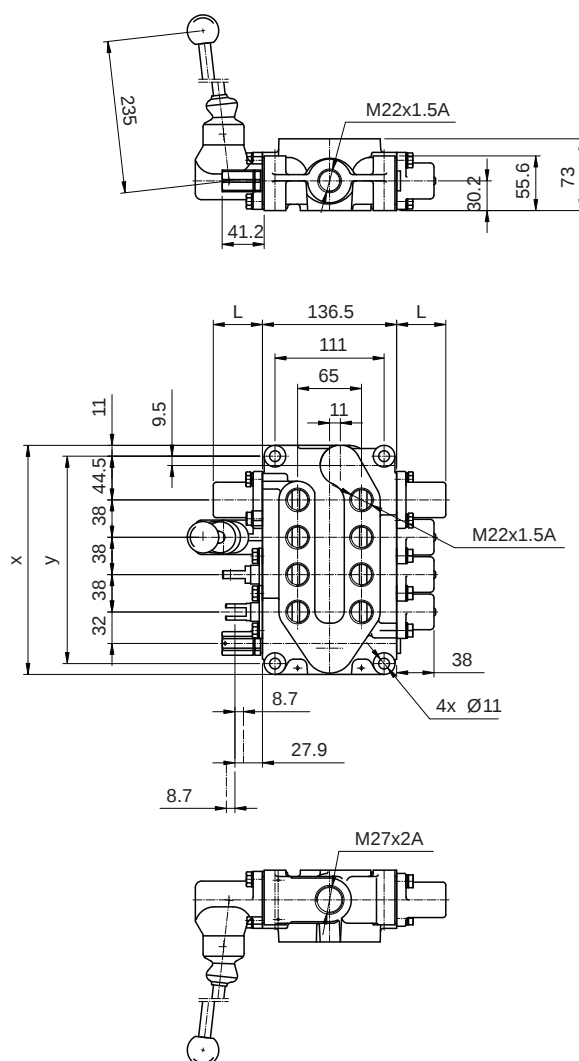
Centring and detent systems

Type	A	B	C	F	G	J	BH	GH
L [mm]	65.0	158	158	158	158	158	160	160

Hydraulic operation

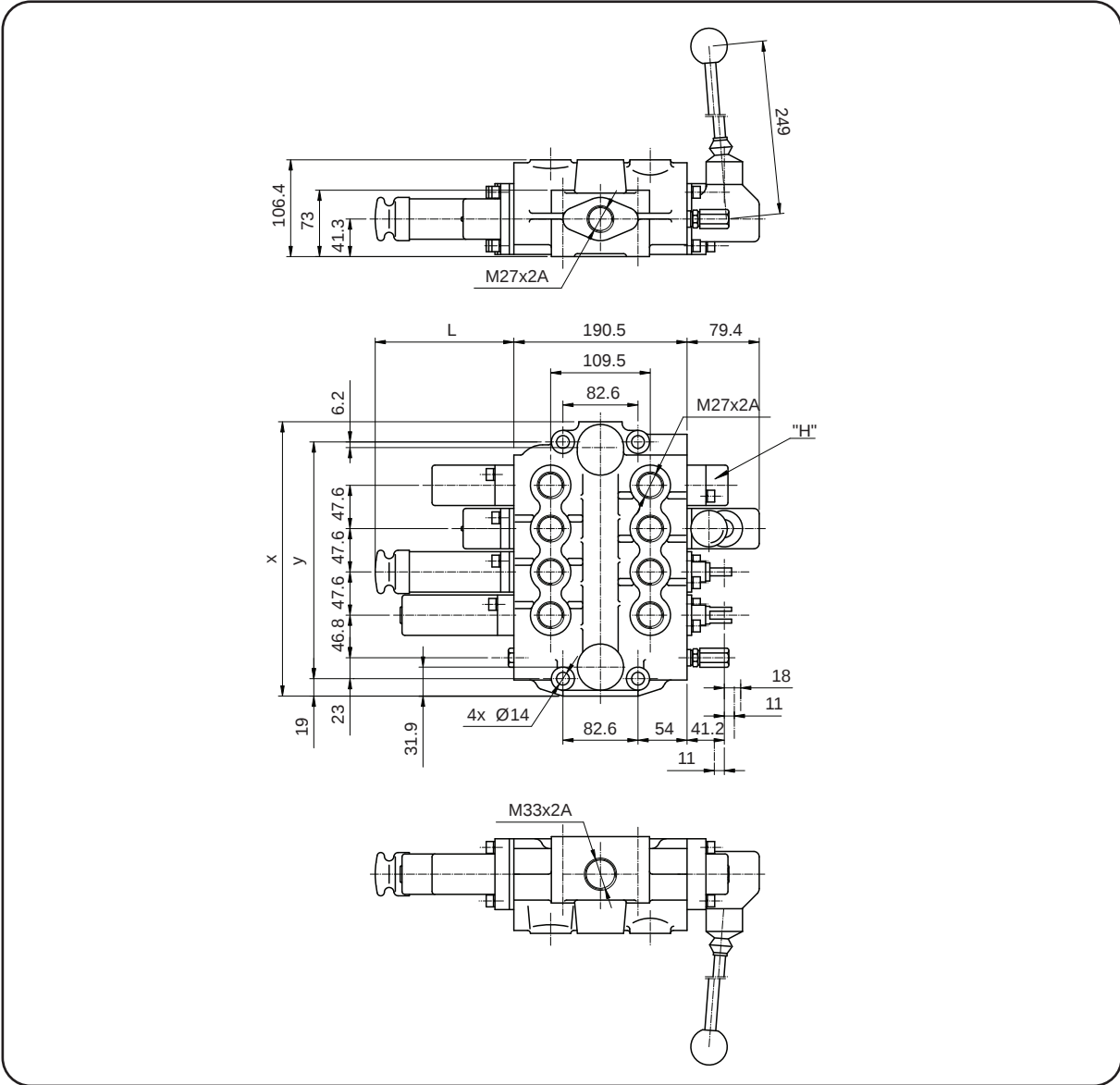
Type of spool	D,S,N,V	F
L [mm]	148	253
L1 [mm]	148	162
L2 [mm]	116	102
L3 [mm]	116	130
L4 [mm]	—	118

Number of spools	Dim. [mm]		WEIGHT (kg)
	x	y	
R1013	2	315.8 249.2	36.0
	3	392.0 325.4	50.0



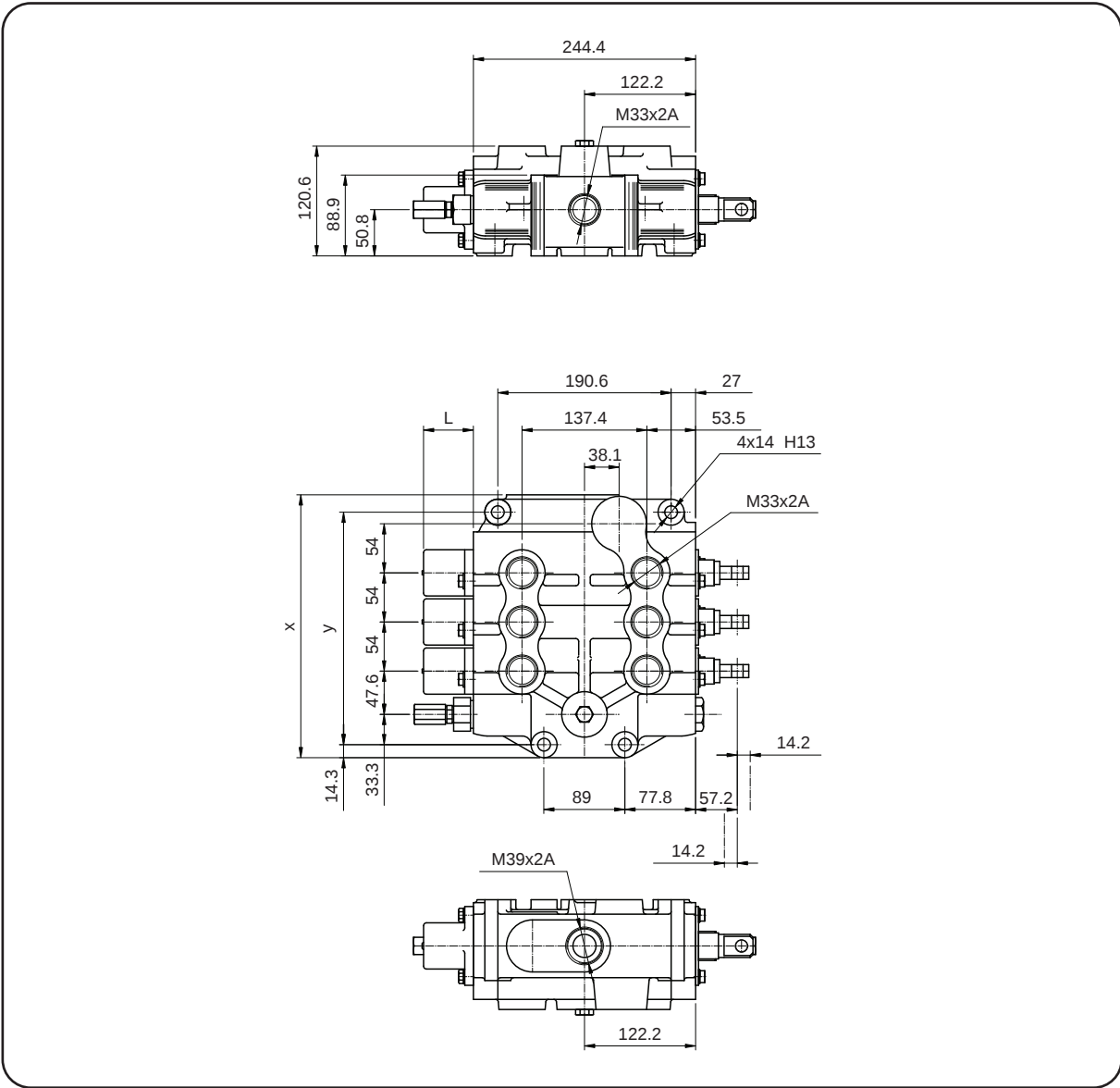
Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1106	2	157.2	135.0	8.0
	3	195.2	173.0	10.0
	4	233.2	211.0	12.0

Centring and detent systems				Hydraulic operation
Typ	A	B	C	H
L [mm]	38	88	88	50



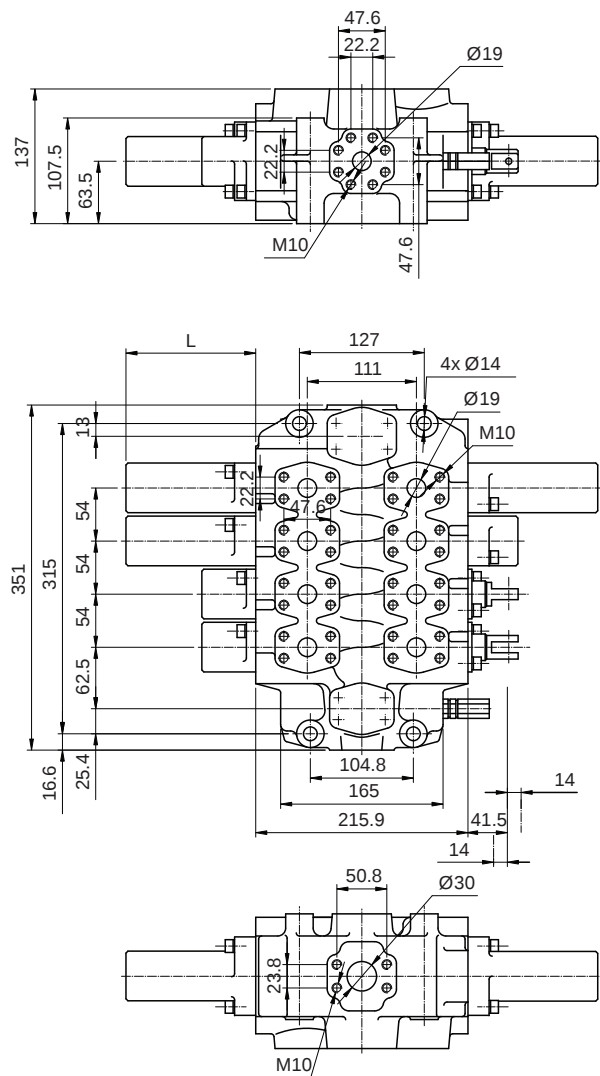
Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1107	2	206.6	165.2	18.0
	3	254.2	212.8	24.0
R4107	4	301.8	260.4	30.0
	6	397.0	355.6	42.0

Centring and detent systems								Hydraulic operation
Type	A	B	C	D	F	G	J	H
L [mm]	55	152.5	152.5	152.5	123	123	123	90

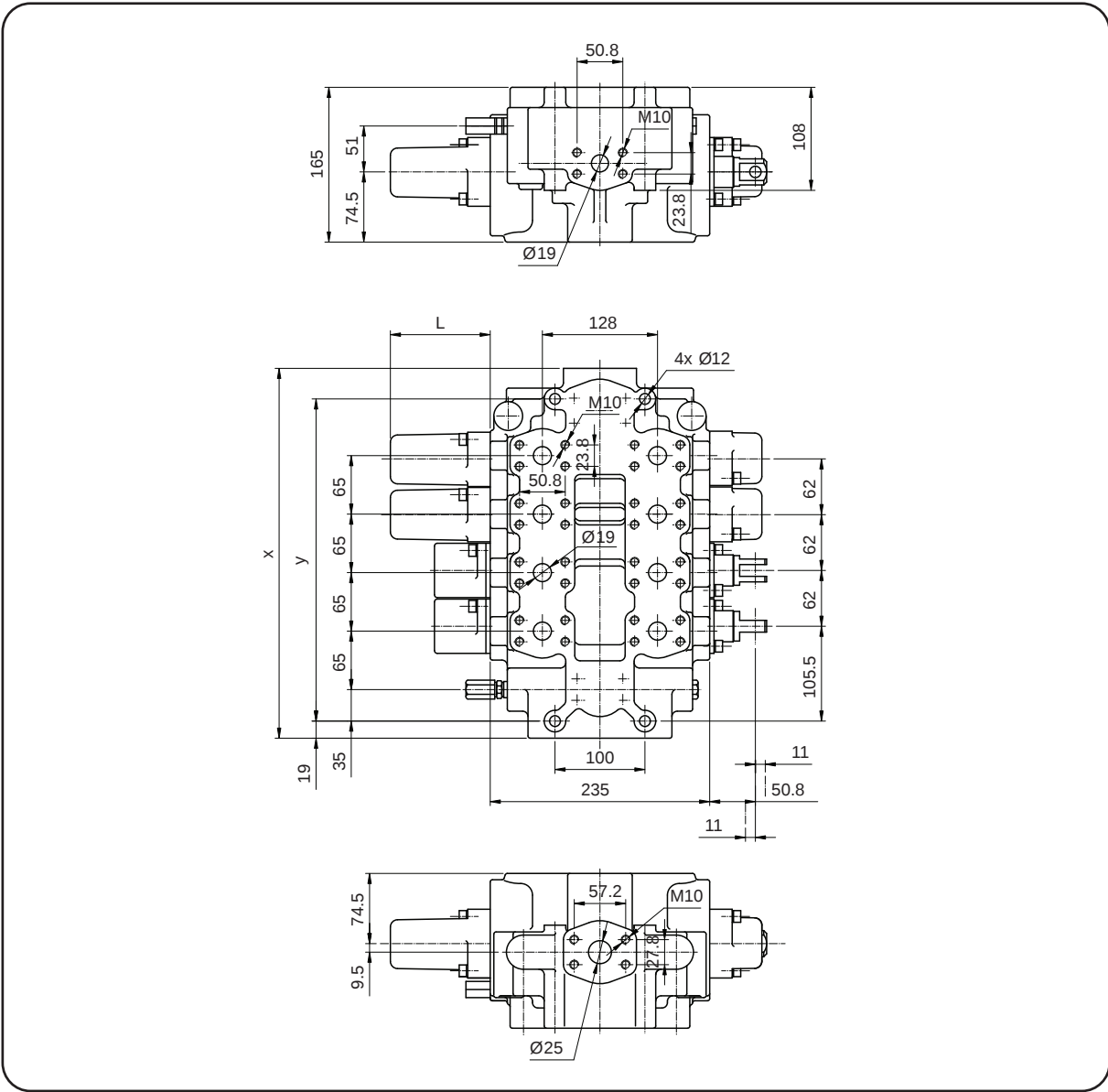


Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R1109	2	235.0	201.6	26.0
R4109	3	289.0	255.6	37.0

Centring and detent systems								Hydraulic operation
Type	A	B	C	D	F	G	J	H
L [mm]	55	115	115	115	138	138	138	100



Centring and detent systems		Hydraulic operation	WEIGHT (kg)
Type	A	H	55.0
L [mm]	58	132	



Number of spools		Dim. [mm]		WEIGHT (kg)
		x	y	
R5311	2	275	228	65.0
	4	405	358	96.0

Centring and detent systems		Hydraulic operation
Type	A	H
L [mm]	62	110

GEAR PUMPS AND MOTORS

HAMWORTHY SERIES

DIRECTIONAL CONTROL VALVES / PRODUCTION RANGE

Directional control valves type *	Rated flow [l/min]	Operating pressure [MPa]	Service Ports**	Number of spools ***	Types of spools						Service line valves				Centring and detent systems								Type of operation		
					D	S	N	V	F	C	MRV	ORV	ACV	CRV	A	B	C	D	F	G	J	BH	GH	R	L
R1007	125	17,5	M27x2	1																					
R4007		21,0		2																					
R1009	200	17,5	M33x2																						
R4009		21,0																							
R1011	320	17,5	SAE flange1'	2																					
				3																					
R1013	450	17,5	SAE flange 1 1/4'	2																					
				3																					
R1106	60	17,5	M22x15	2																					
R4106		21,0		3																					
				4																					
R1107	125	17,5	M27x2	2																					
				3																					
R4107		21,0		4																					
				6																					
R1109	200	17,5	M33x2	2																					
R4109		21,0		3																					
R5111	200	32,0	SAE 3/4	2																					
				4																					
R1308	140	17,5	SAE 3/4	44																					
R5311	200	32,0	SAE 3/4	44																					

* CONTROL VALVES:

- - tandem circuit
- - parallel circuit
- - mixed circuit

** Threaded ports

*** Number of spools in the control valves



APPLICATIONS OF THE PRODUCTS

Machine type	Pumps	Motors	Directional control valves
K-406A	P-1C P2A211313/1606C5B26B26C23C P-293C INTERCHANGEABLE PA220808/1606B61B61C23C	S-051 DRIVE M2A2125C5B25D S-052 TURN M2A21220C5B25D	R-001 R-1107(4D)1VL R-003 R-1109(3D)1V
K-407	P-4C P2A211313C5B26B26C P-291C INTERCHANGEABLE PA220808C5B61B61C	S-052 TURN M2A21220C5B25D	R-084 R-1109(2D)1V R-085 R-1107(3D)3V
K-408	P-4C P2A211313C5B26B26C P-291C INTERCHANGEABLE PA220808C5B61B61C	S-052 DRIVE+TURN M2A21220C5B25D	R-001 R-1107(4D)1VL R-003 R-1109(3D)1V
K-420 STANDARD	P-138 PA220808/1606C5B26B26C23	S-085 M2A2227C5B25D S-118 MC2213C5B66D	R-282 R-13098(4D)13VH R-283 R-1308(4D)14VH
K-611 K-612	P-11C P2A2211616C5B26B26C P-217C INTERCHANGEABLE PA221010C5B48B48C	S-075 M2A1604AD8C23D S-085 M2A2227C5B25D S-099 M2A2125C5B25D3	R-157 R-1308(NNDD)7VH R-158 R-1308(DNDD)8VH
HSW Ł-34	W-21A (303-92-0002) WC40-176C5B26A P-37A (303-92-0003) P2C2110/1613C5B26C23A P-106A (861-10-0164) P2C2110C5B26A		R-97 (313-92-0002) R-1013(DVF)10V
HSW 534	W-1A (861-10-0165) WC32-063C5A1A W-2A (861-10-0153) WC32-085C5A1A W-3A (861-10-0207) WC32-100C5A1A		R-97 (313-92-0002) R-1013(DVF)10V
HSW SB85	P-29A (861-10-0018) P2C2113C5B26A		R-223 (383-39-0012) R-1007(2D)18V
JCB 3C	P2AP2207G2B44A P2APJ2207/1906A297	(919/74200, 27000) (919/74200, 27100)	
JCB 3CX	P2AP2207G2B44A P2APJ2207/1906A297 P2APJ190705A187 P2AP1911R2B2A	(919/74200, 27000) (919/74200, 27100) (919/71200)	
JCB 3D11	P2AP2207G2B44A		
JCB 4C	P2AP2207G2B44A P2APJ2207/1906A297		
JCB 4CX	P2APJ190706C189	(919/71800, 68600)	
JCB 4CX-P8	P2APJ190706C189		
JCB MKII	P2AP1911R2B2A		

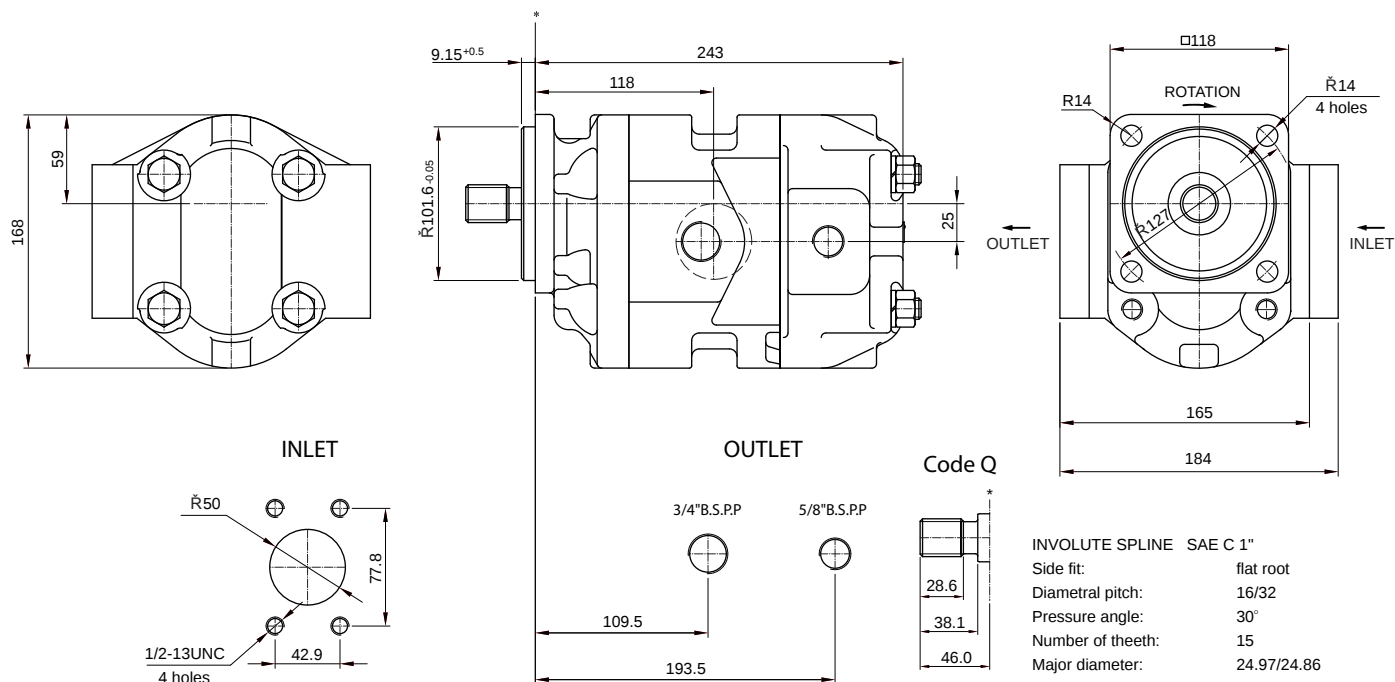


APPLICATIONS OF THE PRODUCTS

Machine type	Pumps	Motors	Directional control valves
JCB Sitemaster	P2APJ190705A187	(919/71400)	
JCB 444	P2APJ190706C189		
JCB 805B	P2AP2208/190707C317		
JCB 806B	P2AP2208/190707C317		
JCB 807	P2AP2208/190909G5B2B2B2C		
JCB 807B	P2AP2208/190909G5B2B2B2C		
JCB 811		MA2210C5B1D	
JCB 812	P2AP2208/190707C317	MA2210C5B1D	
JCB 814	P2AP2208/190707C317	MA2210C5B1D	
MF 50B	P2AP2208C2B31A		
MF 50EX	P2AP2208C2B31A		
MF50HX	P2AP2208C2B31A		
MF5044C	P2AP2208/1907C299		
TAMROCK 400S	P2AP1911/160806A200		
TAMROCK 500S	P2AP1911/160806A200		
TAMROCK DHAT 400	P2AP1911/160806A200		
TAMROCK	P2C1606V8C5A P2CP220808C5B26B26A/C P2CP2215A280 P2CP2213/190706A313 P2AP2216/160808A		
GROVE COLES 910		MZ2215G5B3D	
GROVE COLES	P2C1617B8E5A P2AP22101010/1907C316		
HYMAC 508D		MZX1913Q3B25D	
HYMAC	P2AP19111107C198		
VOLVO H6	P2CP2213/1613A341		
VOLVO FL6	P2AP2210/1909C393		
TEREX	P2AP2208/1907C299		
BOMFORD FARMTRIM, B48X, B53, A580T, B435, B457, B477		M2AX1610X1C5D M2Z1FX1617X1E5D M2AX1610ENX1L32D	



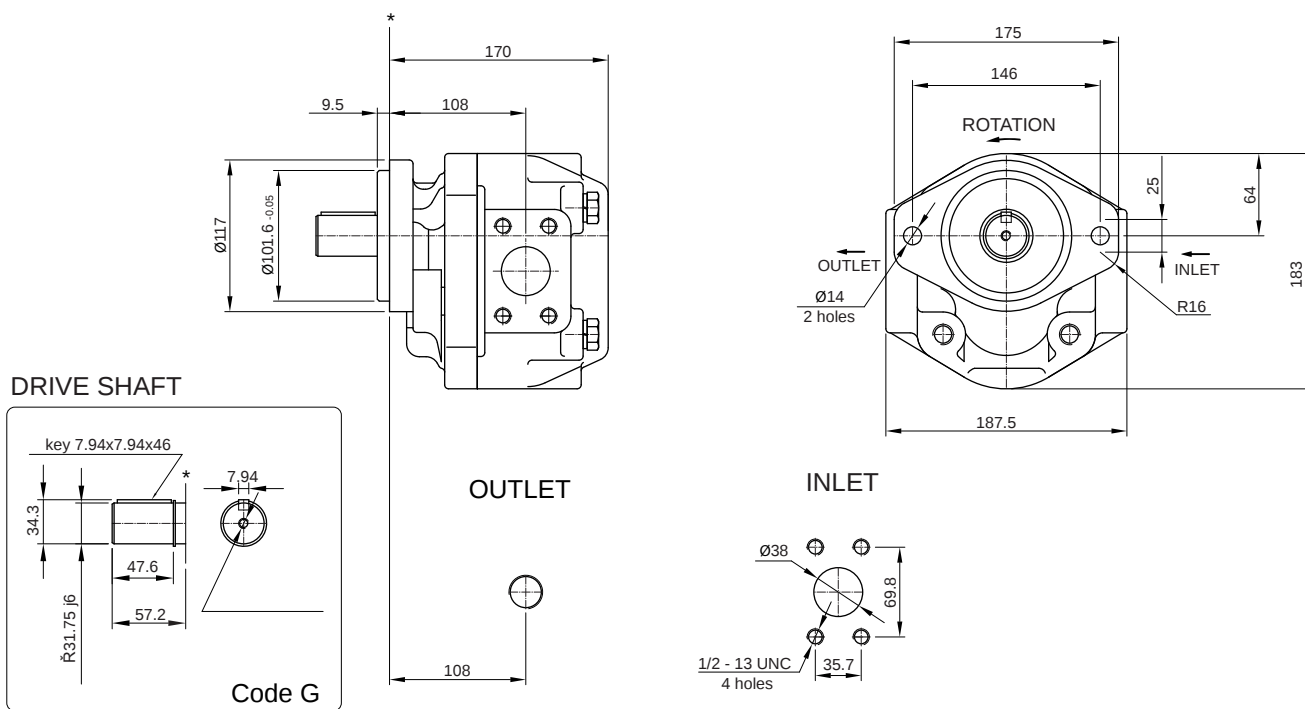
GEAR PUMP APPLICATION



Displacement (Vg) 33.4/28 ccm/rev
Working Pressure (Pr) 21 MPa
Rotation range (N) 600-2700 rpm

GEAR PUMP P2APJ190706C189 (N91C)

Application: JCB 3CX, 4CX, 4CX-P8, 444
(919/71800, 68600)

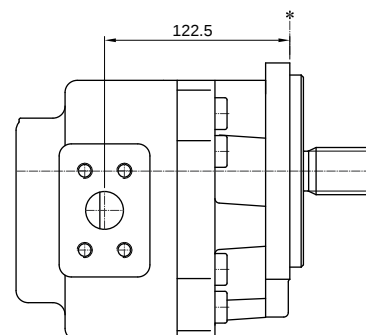
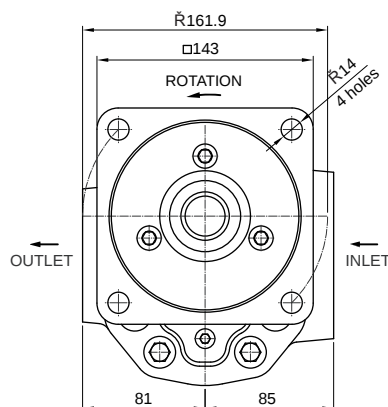
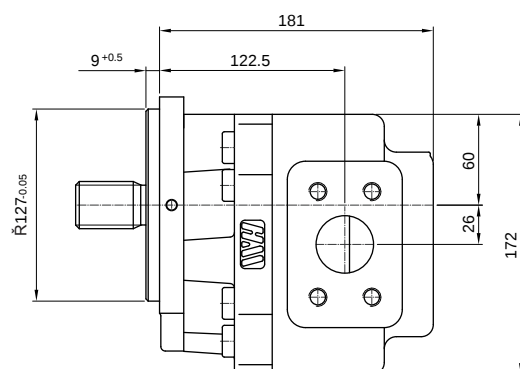


Displacement (Vg) 53.6 ccm/rev
Working Pressure (Pr) 21 MPa
Rotation range (N) 600-2700 rpm

GEAR PUMP P2APJ2207G2B44A (P943A)

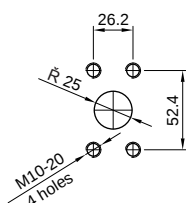
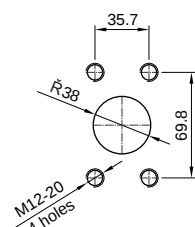
Application: JCB 3CX
(919/74200, 27000)

GEAR PUMP APPLICATION

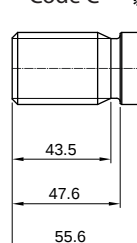


INLET

OUTLET



Code C



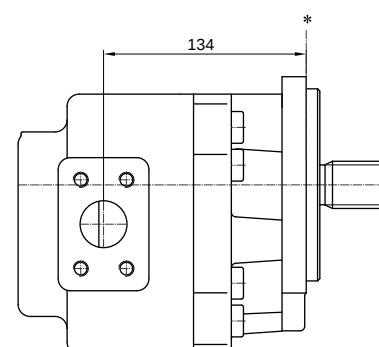
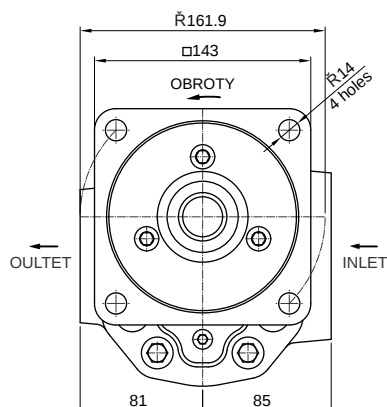
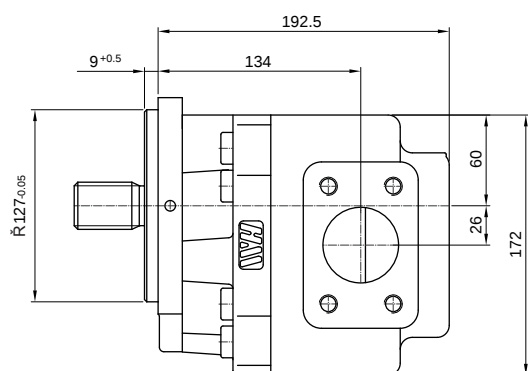
INVOLUTE SPLINE SAE C 1 1/4"
Side fit: flat root
Diametral pitch: 12/24
Pressure angle: 30°
Number of teeth: 14
Major diameter: 31.20/31.12

Displacement (Vg)
Working Pressure (Pr)
Rotation range (N)

63 ccm/rev.
25 MPa
600-2700 rpm

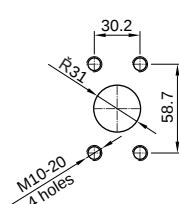
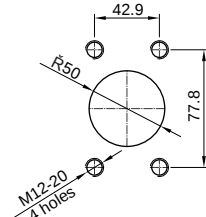
GEAR PUMP WC32-063C5A1A (W1A)

Application: HSW 534
(861-10-0165)

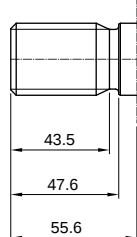


INLET

OUTLET



Code C



INVOLUTE SPLINE SAE C 1 1/4"
Side fit: flat root
Diametral pitch: 12/24
Pressure angle: 30°
Number of teeth: 14
Major diameter: 31.20/31.12

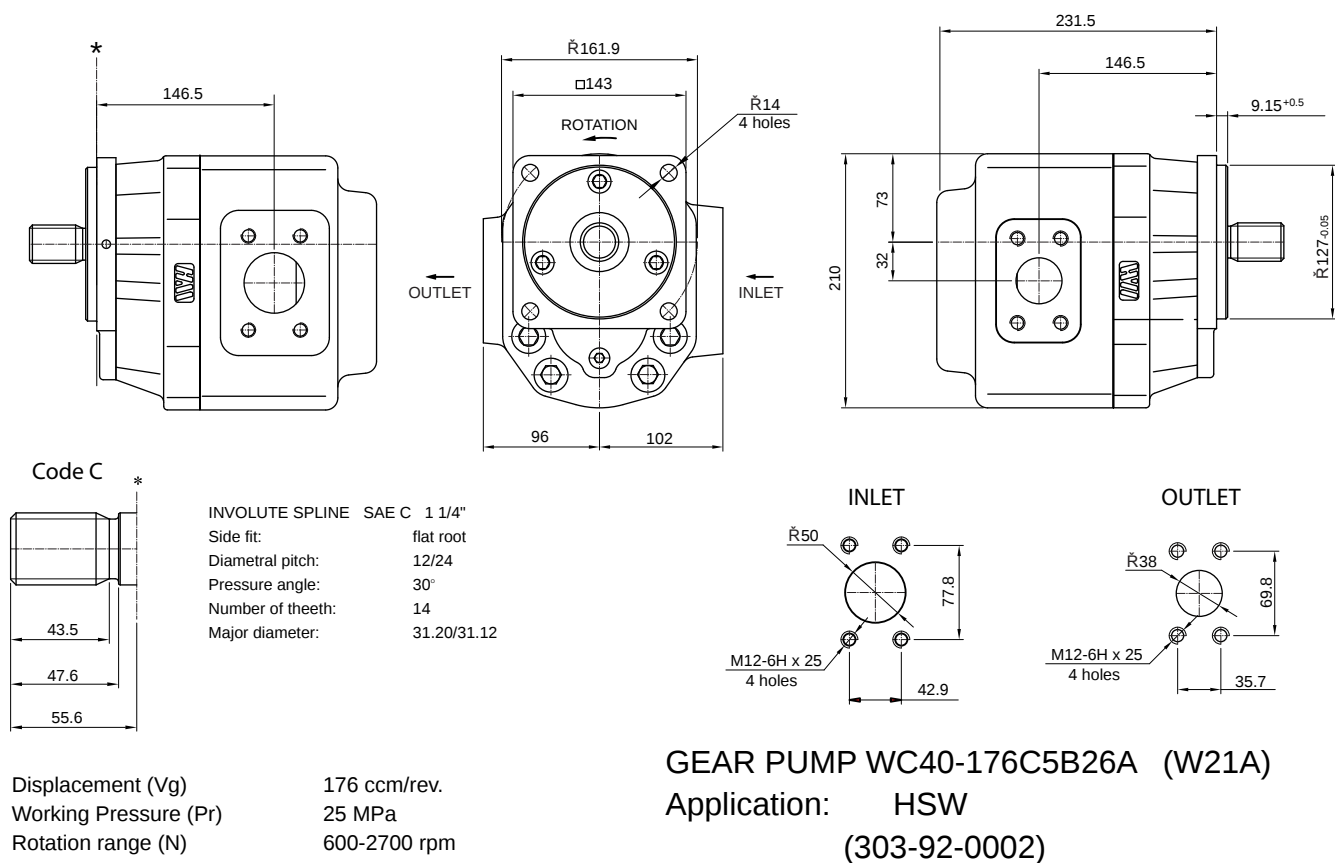
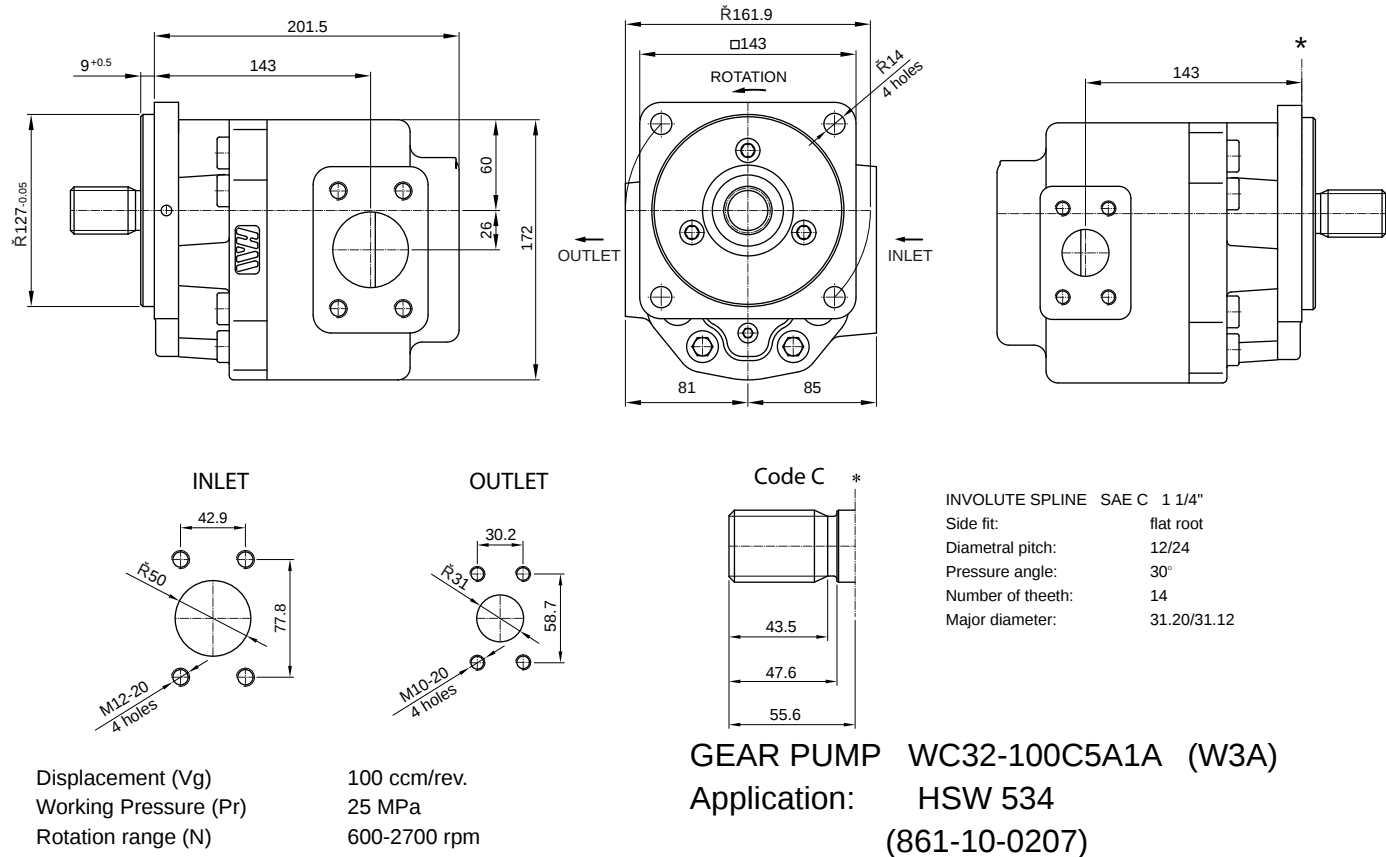
Displacement (Vg)
Working Pressure (Pr)
Rotation range (N)

85 ccm/rev.
25 MPa
600-2700 rpm

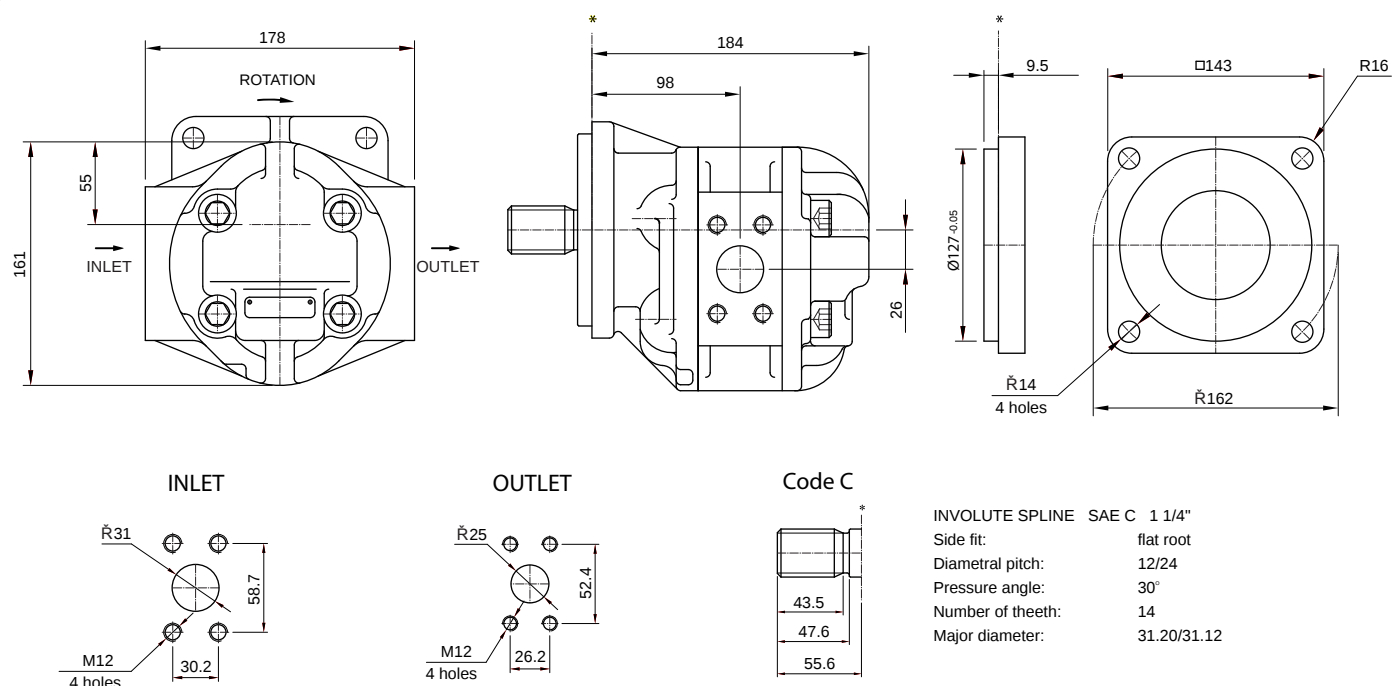
GEAR PUMP WC32-085C5A1A (W2A)

Application: HSW 534
(861-10-0153)

GEAR PUMP APPLICATION

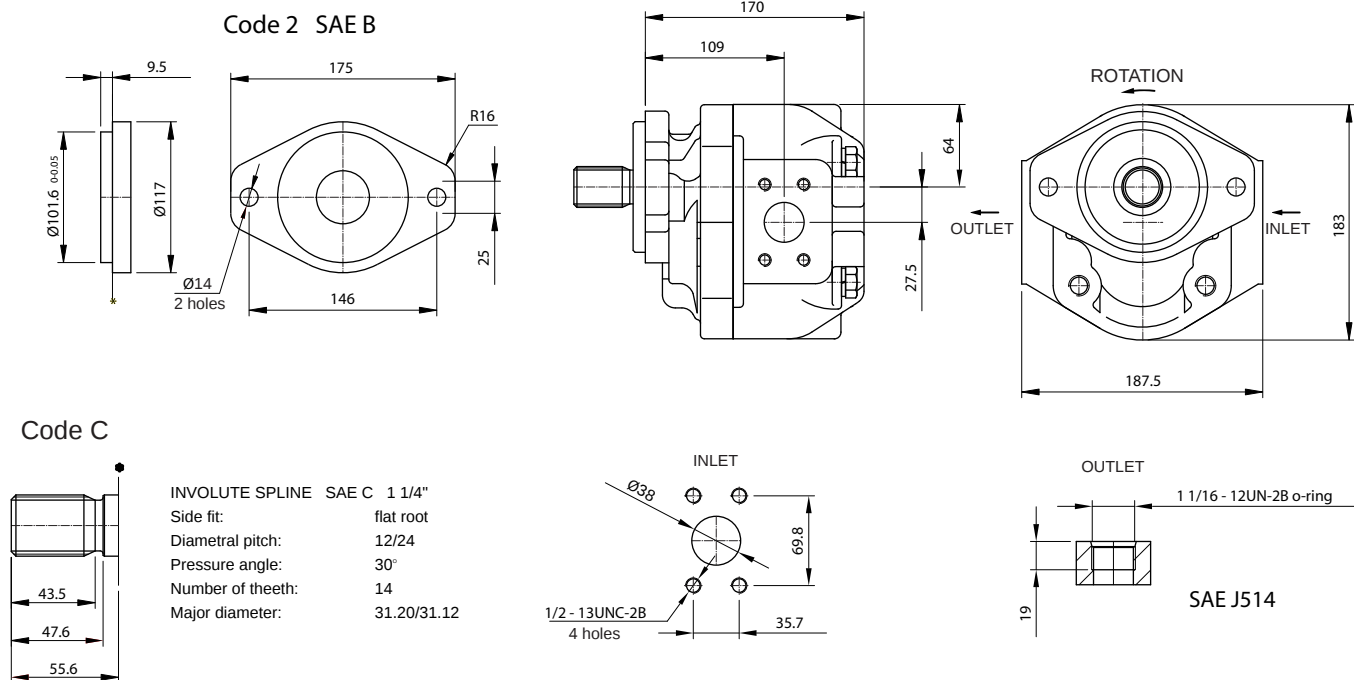


GEAR PUMP APPLICATION



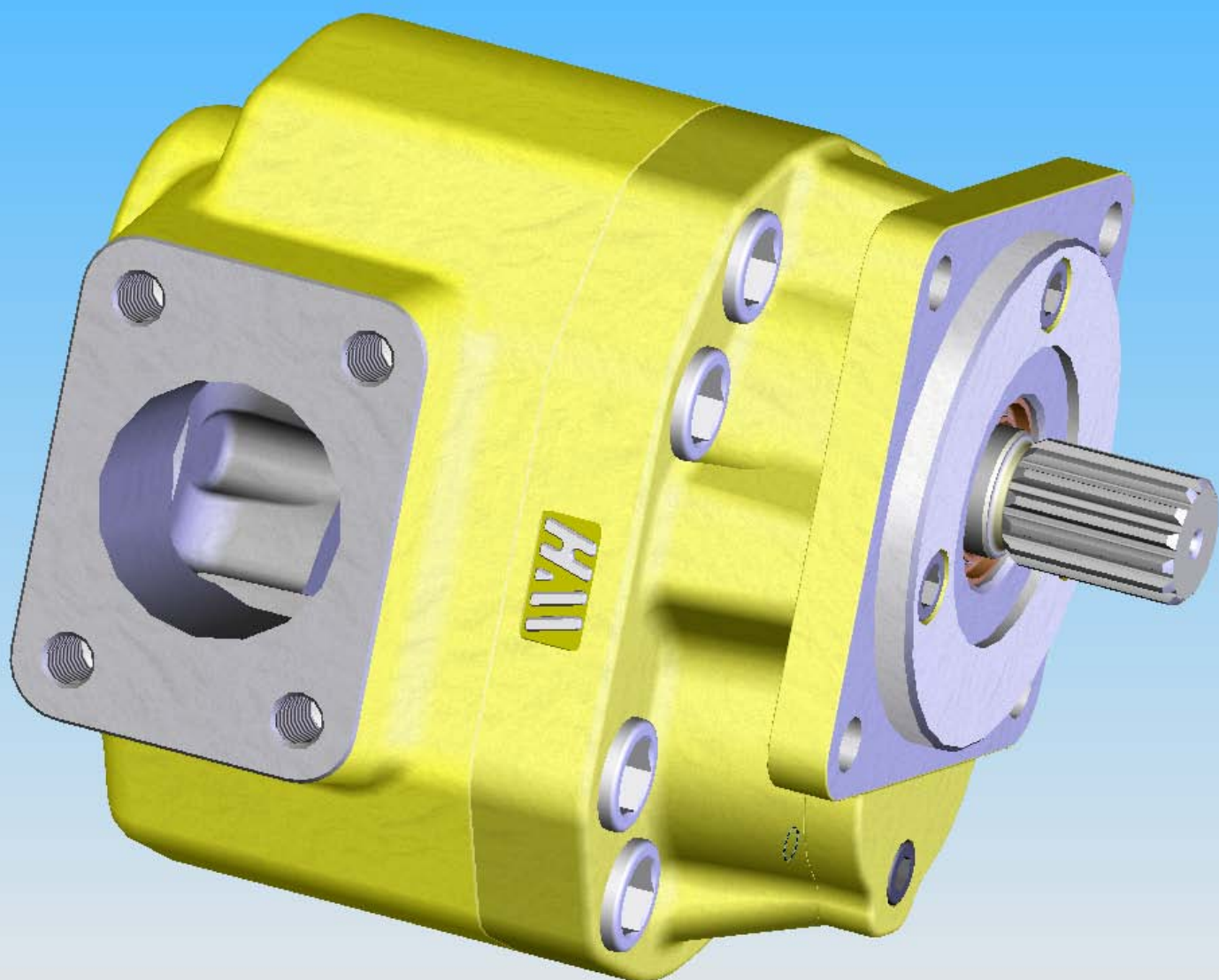
Displacement (Vg) 44 ccm/rev
 Working Pressure (Pr) 17 MPa
 Rotation range (N) 600-2700 rpm

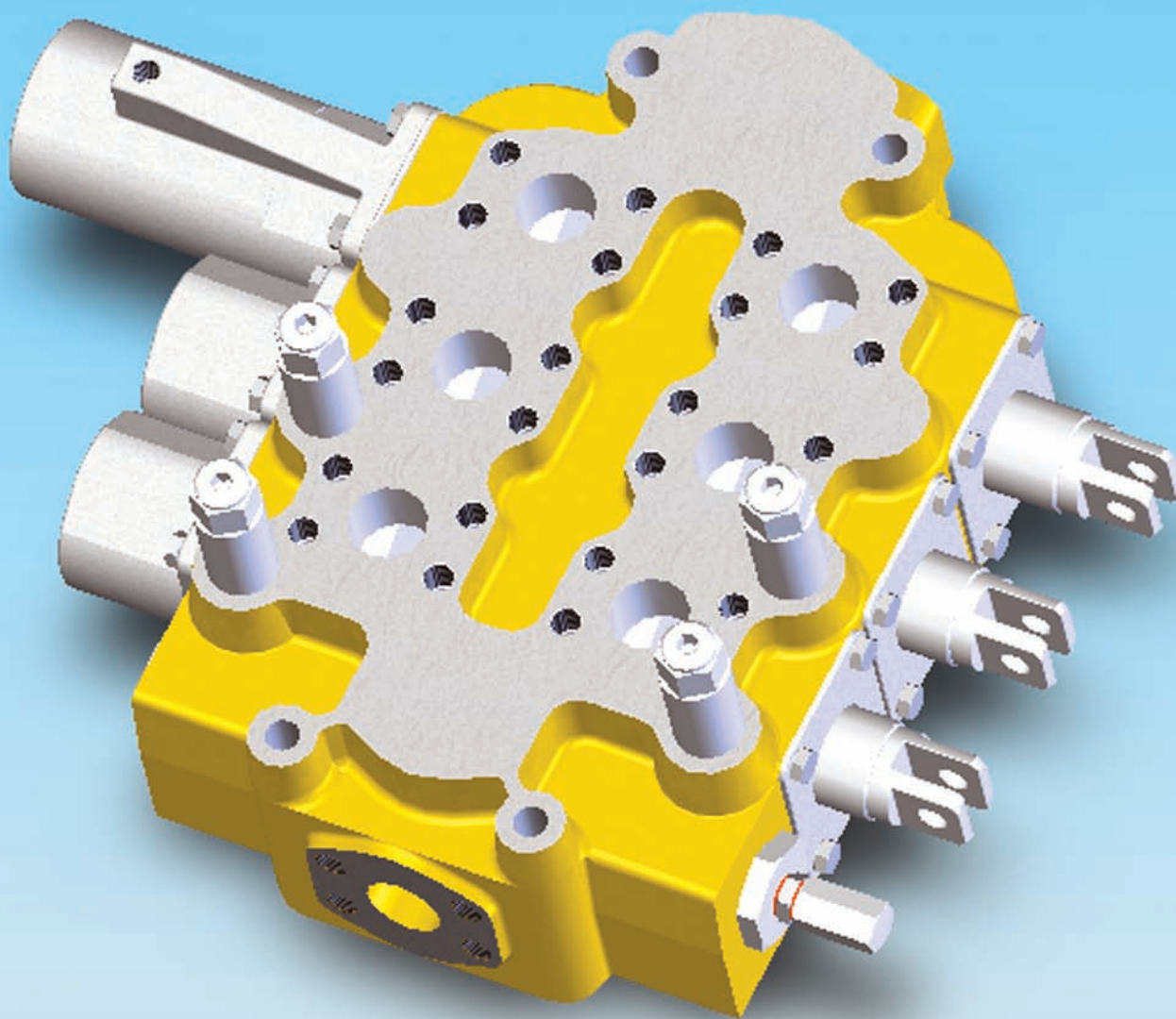
GEAR PUMP P2C2110C5B26A (P106A)
Application: HSW L-34
(861-10-0164)



Displacement (Vg) 58.7 ccm/rev
 Working Pressure (Pr) 21 MPa
 Rotation range (N) 600-2700 rpm

GEAR PUMP P2C2208C5B31A
Application: MF50B / 50HX
(1470214M91)





R97 (R1013DVF10V - 313-92-0002)



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