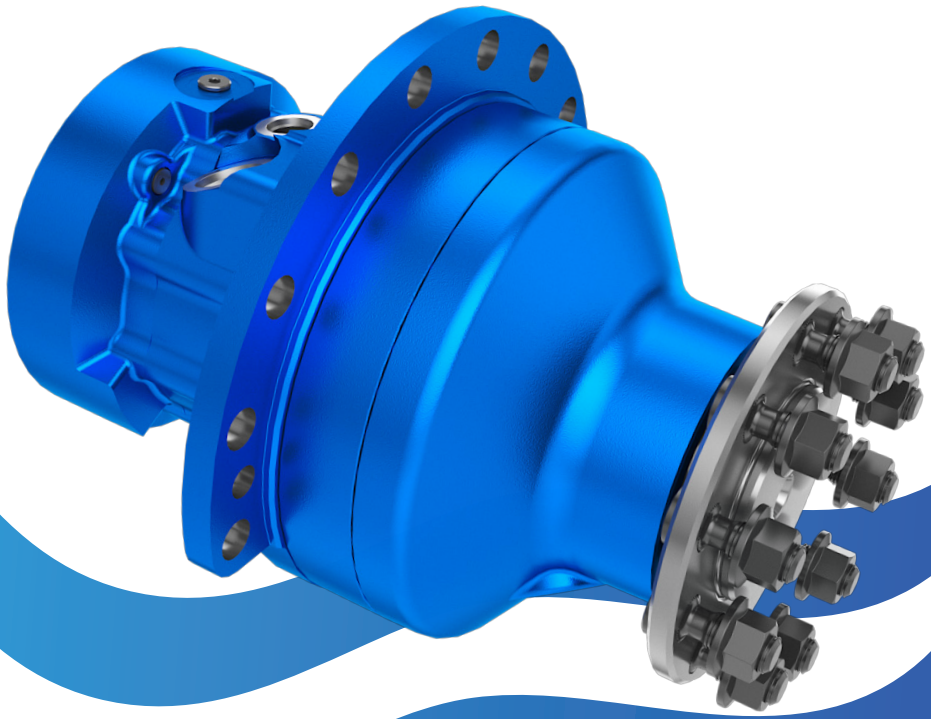
XJ05
RADIAL PISTON MOTOR



ROTARY POWER

You are at the **centre**
of everything we do

CONTENTS

ABOUT US

Rotary Power specialises in the design, development and manufacture of hydraulic motors and pumps.

With a history dating back over 50 years, we understand the exacting and demanding requirements of today's hydraulic applications.

Operating from 18,000 sq. m. of purpose built manufacturing facilities, based in the North East of England and Bangalore, India, we continue to invest in the latest CNC machinery, automation and testing facilities. We have a clear focus on continuous improvement in lean cellular manufacturing. These facilities, alongside our European and US operations, offer sales, service and production support for the entire Rotary Power product range. A worldwide network of distribution partnerships provide additional support all over the world.

OUR BUSINESS

We recognise the importance of developing partnerships with our customers. That's why we offer flexibility in design, delivery and service to meet our customer's requirements.

Partnerships with our supply chain are key to Rotary Power's success and allow us to deliver excellent service in order to exceed expectations.

OUR PEOPLE

People are at the centre of everything we do. As an innovative engineering and manufacturing business we take recruitment and career development very seriously.

As part of the British Engines Group, we operate a training and development programme that maintains a strong focus on in-house manufacturing and a commitment to local employment. Our apprenticeship and graduate schemes provide the opportunity to develop and nurture engineering talent from an early stage.

OUR FUTURE

Whether in product design or internal processes and systems, our engineers are actively encouraged to develop new ideas within design and manufacturing. This ensures that we are at the forefront of customer and sector led innovation, whilst continuously improving our business.

Our team of in-house design engineers invest time into understanding our customer's application and work with them to deliver value added solutions, customised to their application.

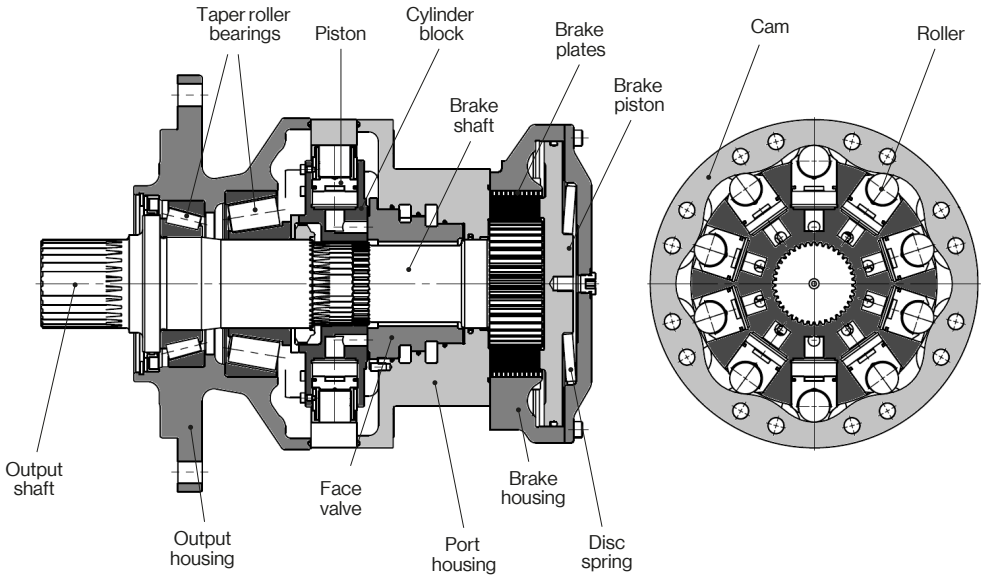
XJ RANGE

The XJ range of hydraulic motors offer displacements from 260 to 5,010 cc/rev. The XJ05 is the smallest of the range with displacements from 260 to 750 cc/rev, complemented by the larger XJ20 and XJ40 motors extending the displacement range to 2,505 and 5,010 cc/rev.

The XJ motor has a range of features and options designed to suit your specific application:

- Radial piston, multi-stroke operation
- Modular design
- Two speed options
- Parking brake options
- Freewheel capability
- Multiple mounting arrangements
- 350 bar continuous pressure
- Fast delivery options

The motor is designed with a rotating cylinder block connected to the drive shaft, which is mounted in taper roller bearings within the motor housing. This offers a high radial and axial load carrying capacity.



The pistons are located radially within the bores of the cylinder block. When oil is fed under pressure through the face valve and into the cylinder block, the pistons attempt to move outwards. The rollers react on the incline of the cam profile and this action produces rotation of the cylinder block.

The rate of flow to the motor will determine the speed at which the piston moves out against the cam ring and consequently the rotational speed of the motor. Once the power stroke is complete, the pistons return into the bore by the action of the reverse cam slope, ready for the next pressure cycle.

With units operating all over the world in a variety of applications including industrial, mobile and marine, the XJ range offers real application options for the future.

PRODUCT FEATURES
STANDARD DISPLACEMENTS

Fluids	HL; HLP to DIN 51524 Other specified fluids are possible.
Normal operating viscosity range	20 to 200 cSt
Maximum intermittent viscosity range	10 to 2,000 cSt
Normal operating temperature range	+15°C to +70°C [+59°F to +158°F]
Maximum intermittent temperature range	-20° to +80° C [-4°F to +176°F]
Fluid cleanliness	ISO 4406 Code 18/16/13 (NAS 1638 Class 7)

FIRST DISPLACEMENT

Displacement option	**Y**	**A**	**B**	**C**	**D**	**E**
Geometric displacement (cc/rev) [in³]	260 [15.9]	376 [22.9]	424 [28.5]	468 [28.5]	515 [31.4]	560 [34.2]
Specific torque (Nm/bar) [lbf.ft/psi]	4.1 [0.21]	6.0 [0.30]	6.7 [0.34]	7.4 [0.38]	8.2 [0.42]	8.9 [0.45]
Max. continuous speed (rpm)	300	250	230	210	200	180
Max. continuous power (kW) [hp]	29 [38.9]	29 [38.9]	29 [38.9]	29 [38.9]	29 [38.9]	29 [38.9]
Max. continuous pressure (bar) [psi]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]
Max. pressure (bar)* [psi]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]

SECOND DISPLACEMENT

Nominal displacement (cc/rev)	**Y**	**A**	**B**	**C**	**D**	**E**
Geometric displacement (cc/rev) [in³]	130 [7.9]	188 [11.5]	212 [12.9]	234 [14.3]	258 [15.7]	280 [17.1]
Specific torque (Nm/bar) [lbf.ft/psi]	2.1 [0.11]	3.0 [0.15]	3.4 [0.17]	3.8 [0.19]	4.1 [0.21]	4.5 [0.23]
Max. continuous speed (rpm)	330	310	280	260	240	220
Max. continuous power (kW) preferred direction [hp]	19 [25.5]	19 [25.5]	19 [25.5]	19 [25.5]	19 [25.5]	19 [25.5]
Max. continuous power (kW) non-preferred direction [hp]	15 [20.1]	15 [20.1]	15 [20.1]	15 [20.1]	15 [20.1]	15 [20.1]
Max. continuous pressure (bar) [psi]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]	350 [5,076]
Max. pressure (bar)* [psi]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]	450 [6,527]

*Maximum values should only be applied for a small portion of the duty cycle.

kg Weight of motor without oil

Sizes are listed in mm, inches shown in brackets

Fluids	HL; HLP to DIN 51524 Other specified fluids are possible
Normal operating viscosity range	20 to 200 cSt
Maximum intermittent viscosity range	10 to 2,000 cSt
Normal operating temperature range	+15°C to +70°C [+59°F to +158°F]
Maximum intermittent temperature range	-20° to +80° C [-4°F to +176°F]
Fluid cleanliness	ISO 4406 Code 18/16/13 (NAS 1638 Class 7)

FIRST DISPLACEMENT

Displacement option	**1**	**2**	**3**	**4**
Geometric displacement (cc/rev) [in³]	503 [30.7]	625 [38.1]	688 [42.]	750 [45.8]
Specific torque (Nm/bar) [lbf.ft/psi]	8.0 [0.41]	9.9 [0.51]	10.9 [0.56]	11.9 [0.61]
Max. continuous speed (rpm)	230	190	170	155
Max. continuous power (kW) [hp]	29 [38.9]	29 [38.9]	29 [38.9]	29 [38.9]
Max. continuous pressure (bar) [psi]	300 [4,351]	300 [4,351]	300 [4,351]	300 [4,351]
Max. pressure (bar)* [psi]	400 [5,802]	400 [5,802]	400 [5,802]	400 [5,802]

SECOND DISPLACEMENT

Nominal displacement (cc/rev)	**1**	**2**	**3**	**4**
Geometric displacement (cc/rev) [in³]	252 [15.4]	313 [19.1]	344 [21.]	375 [22.9]
Specific torque (Nm/bar) [lbf.ft/psi]	4.0 [0.20]	5.0 [0.25]	5.5 [0.28]	6.0 [0.30]
Max. continuous speed (rpm)	300	250	210	190
Max. continuous power (kW) preferred direction [hp]	19 [25.5]	19 [25.5]	19 [25.5]	19 [25.5]
Max. continuous power (kW) non-preferred direction [hp]	15 [20.1]	15 [20.1]	15 [20.1]	15 [20.1]
Max. continuous pressure (bar) [psi]	300 [4,351]	300 [4,351]	300 [4,351]	300 [4,351]
Max. pressure (bar)* [psi]	400 [5,802]	400 [5,802]	400 [5,802]	400 [5,802]

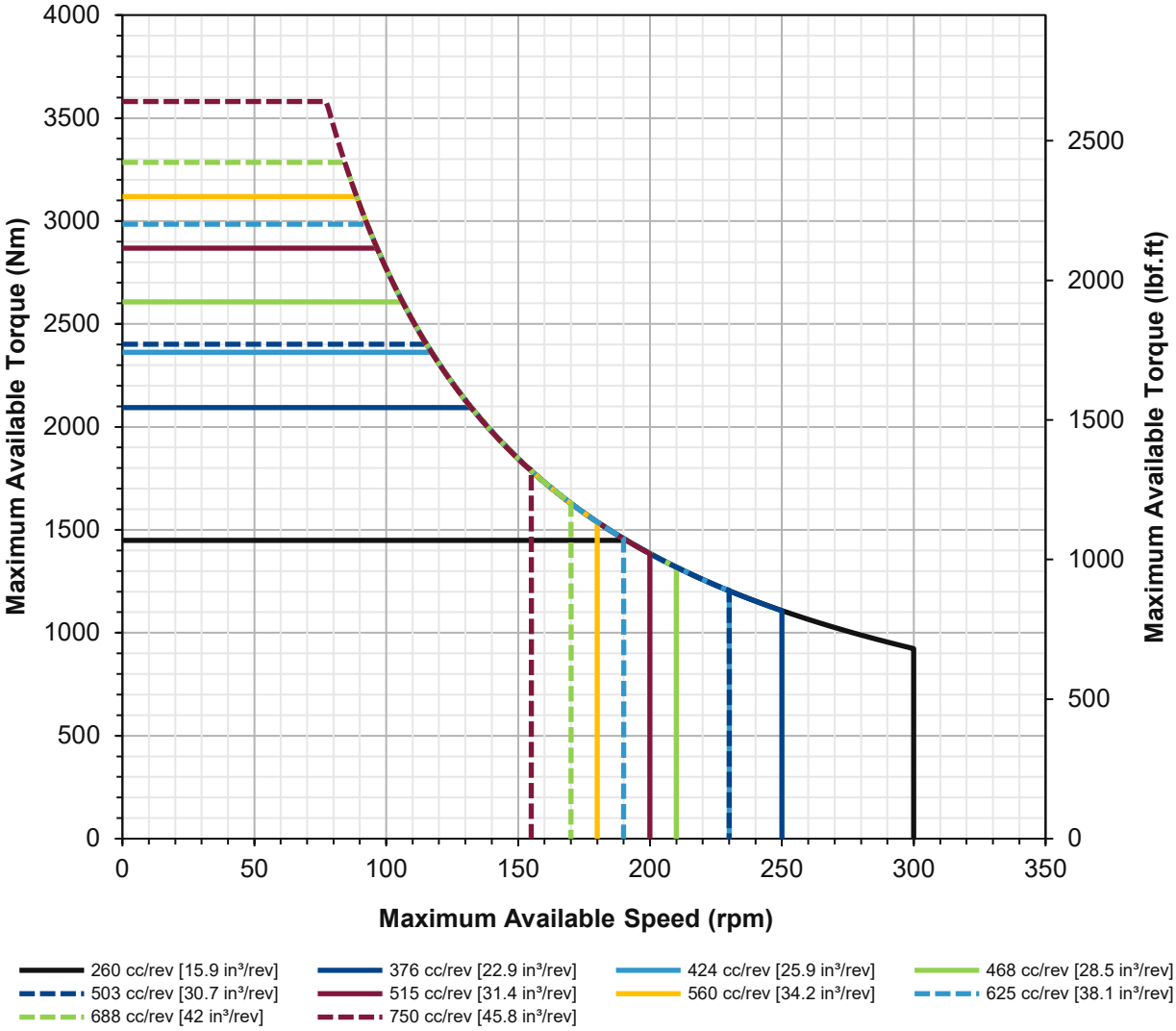
*Maximum values should only be applied for a small portion of the duty cycle.

Approx weight of motor without oil

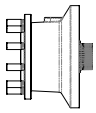
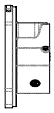
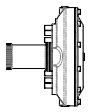
Sizes are listed in mm, inches shown in brackets

QUICK SELECTION DIAGRAM

Based on your torque and speed requirements, the diagram below can be used to help determine which displacement best suits your application. Shown for both standard (solid lines) and increased (dashed lines) displacements, the diagram outlines the limits of the motor based on its continuous power rating and maximum continuous pressure.



MOTOR ORDER CODE

PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3

PRODUCT

01	**XJ05**		Radial piston motor

CAM - DISPLACEMENT

02	**Y**	Standard Displacements	260 cc/rev
	A		376 cc/rev
	B		424 cc/rev
	C		468 cc/rev
	D		515 cc/rev
	E		560 cc/rev
	1	Increased Displacements	503 cc/rev
	2		625 cc/rev
	3		688 cc/rev
	4		750 cc/rev

FRONT MODULE - CASE STYLE

03	**T**	Torque unit
	S	Shaft motor, front case flange
	W	Wheel motor, no case flange
	C	Compact wheel motor, no case flange

FRONT MODULE - OUTPUT SHAFT

04	**N**	No shaft (torque unit DIN 5480 - N48 x 2 x 30 x 22 x 9H spline)
	G	No shaft (torque unit NF E22 - N50 x 1.667 x 28 spline)
	D	Splined shaft (DIN 5480 - W55 x 3 x 30 x 17 x 8f)
	F	Splined shaft (NF E22-141 - 50 x 1.667 x 28)
	A	Keyed shaft - Ø50
	K	Wheel output 10 off, Ø140 PCD, Ø92.7 spigot
	P	Wheel output 5 off, Ø140 PCD, Ø92.7 spigot
	L	Large wheel output 6 off, Ø205 PCD, Ø160.7 spigot

FRONT MODULE - OUTPUT FITTINGS

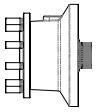
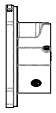
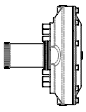
05	**N**	None (torque unit or shaft motor)
	A	Wheel flange with M14x1.5 studs fitted
	B	Wheel flange with M14x1.5 studs & nuts fitted
	C	Wheel flange with M12x1.5 tapped holes
	F	Wheel flange with Ø18.0 holes
	G	Wheel flange with M18x1.5 studs & nuts fitted (large wheel only)

FRONT MODULE - SHAFT SEAL CONFIGURATION

06	**1**	Standard

FRONT MODULE - FRONT BRAKE

07	**N**	No brake (standard)

PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3

PORT MODULE - MOUNTING FLANGE

08	**N**	No flange (torque units and shaft motors)
	H	Horseshoe flange (wheel motors only)
	L	Lug flange (two-speed wheel motors only)

PORT MODULE - SPEED AND ROTATION

09	**1R**	Single speed - Pressure port A = CW rotation
	1L	Single speed - Pressure port A = ACW rotation
	RA	Two-Speed (Ratio 2:1) CW preferred rotation
	LA	Two-Speed (Ratio 2:1) ACW preferred rotation

PORT MODULE - HYDRAULIC CONNECTIONS

10	**0**	No port block
	1	All ports SAE J514 O ring boss
	3	All ports BSP ('G' Ports)

PORT MODULE - ADDITIONAL CIRCUIT VALVING

11	**N**	None

PORT MODULE - SPEED SENSOR

12	**N**	None
	S	Speed sensor port in housing
	T	Speed sensor included
	U	Speed sensor and connector included

REAR BRAKE

13	**N**	None
	R	"R" parking brake (4,220 Nm)

OPTIONS

14 15 16	**0**	None
	G	Special paint (specify RAL No)
	P	Shaft-up vent port
	V	Viton seal material

SPECIALS

17	**00**	Rotary Power specified

DESIGN SERIES

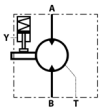
18	**A3**	Design series

TORQUE UNIT
SINGLE SPEED OPTION

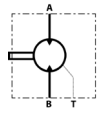
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		T	N	N	1	N	N			N	N					00	A3

(For models shown below)

kg 32 kg with brake

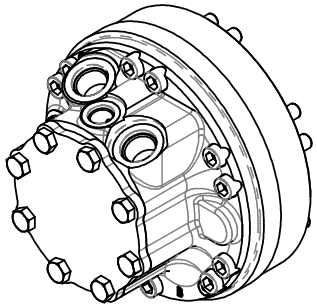


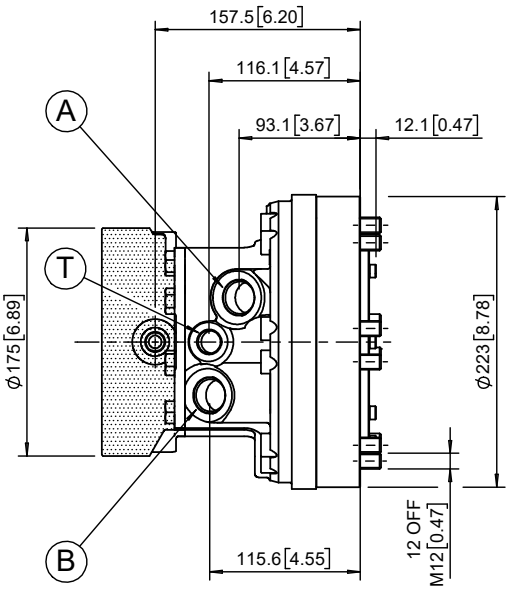
kg 24 kg without brake

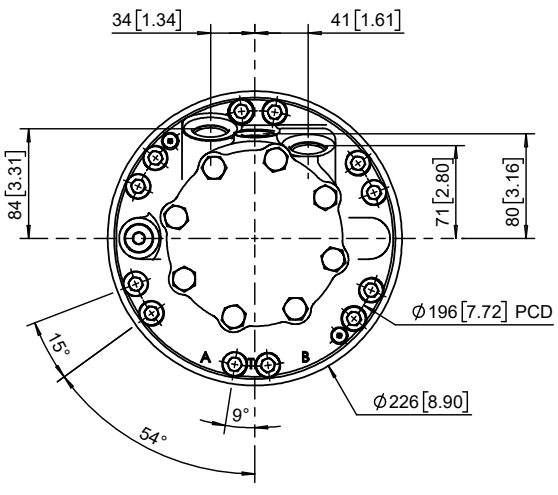


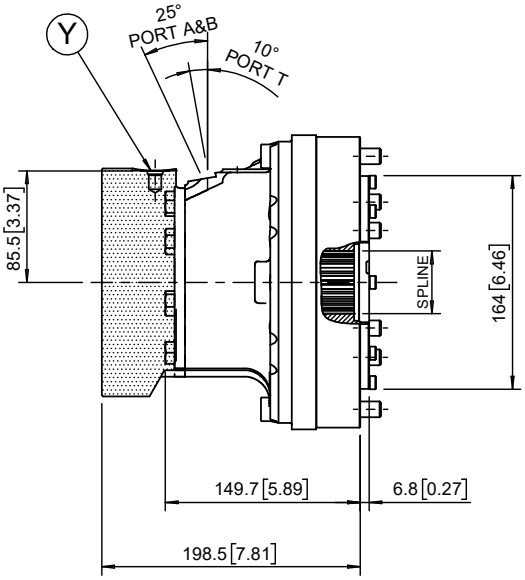
N	None	See Rotary Power for more details.
H	Horseshoe	

Rotor spline
DIN 5480: N48 x 2 x 30 x 22 x 9H
Other spline options available, contact us for more information.
See page 23 for hydraulic connection options.







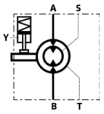


TORQUE UNIT
TWO SPEED OPTION

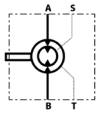
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		T	N	N	1	N	N			N	N					00	A3

(For models shown below)

kg 35kg with brake

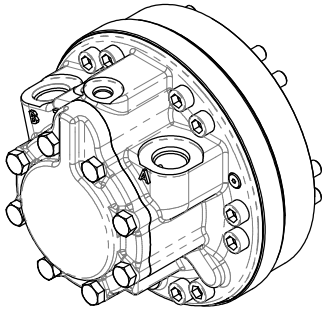


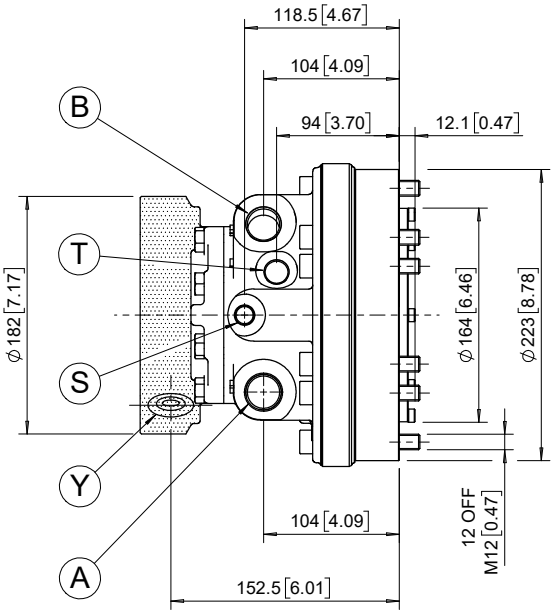
kg 29kg without brake

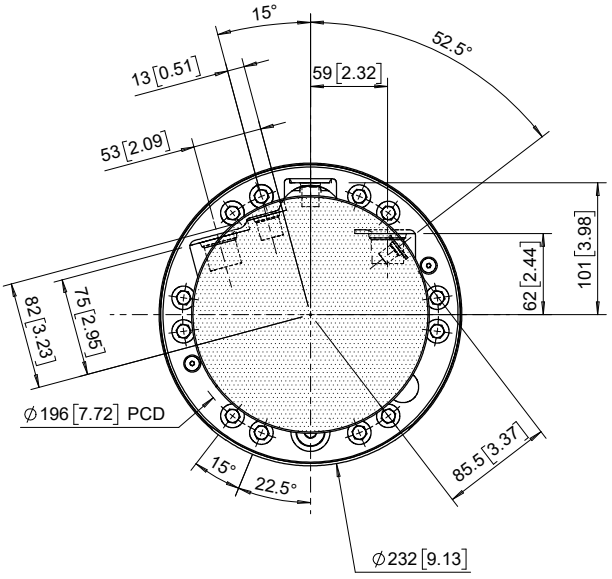


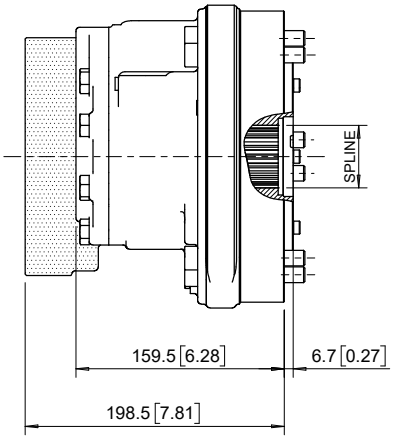
N	None	See Rotary Power for more details.
H	Horseshoe	
L	Lug	

Rotor spline
DIN 5480: N48 x 2 x 30 x 22 x 9H
Other spline options available, contact us for more information.
See page 23 for hydraulic connection options.







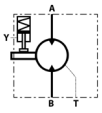


SHAFT MOTOR
SINGLE SPEED WITH SPLINE

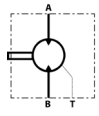
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		S	D	N	1	N	N			N	N					00	A3

(For models shown below)

kg 52 kg with brake



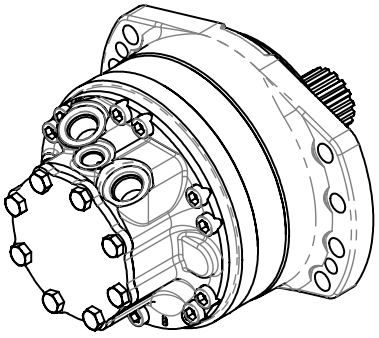
kg 44 kg without brake

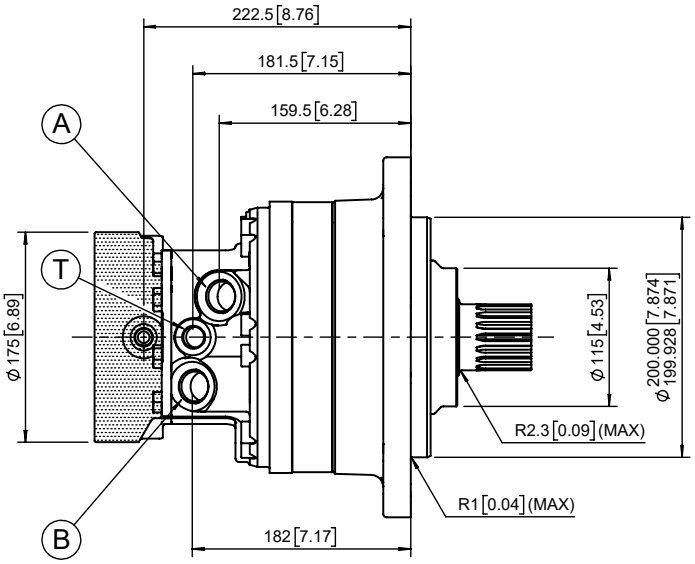


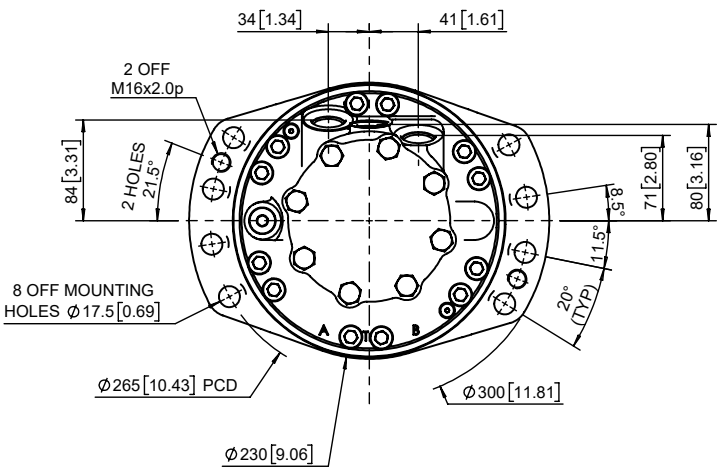
Shaft spline
DIN 5480: W55 x 3 x 30 x 17 x 8f

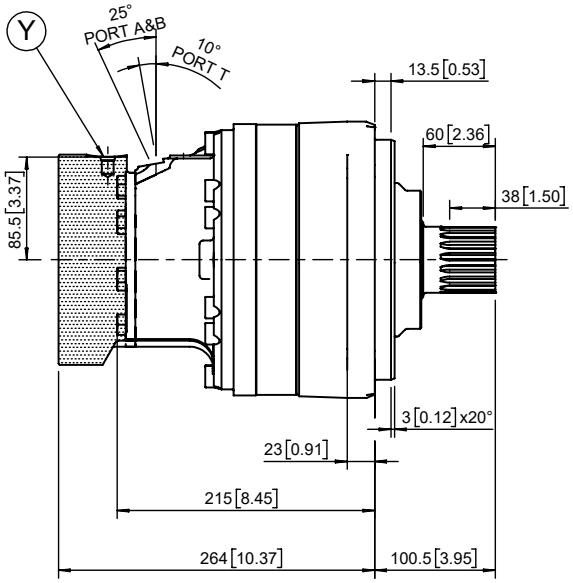
See page 14 for additional shaft options.

See page 23 for hydraulic connection options.







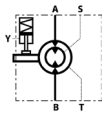


SHAFT MOTOR
TWO SPEED WITH SPLINE

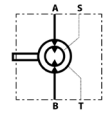
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		S	D	N	1	N	N			N	N					00	A3

(For models shown below)

kg 55kg with brake



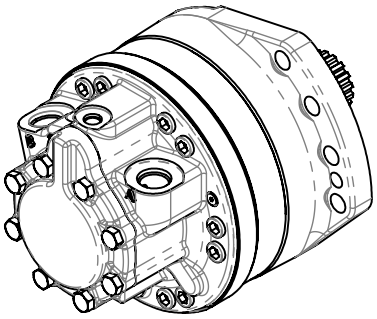
kg 52 kg without brake

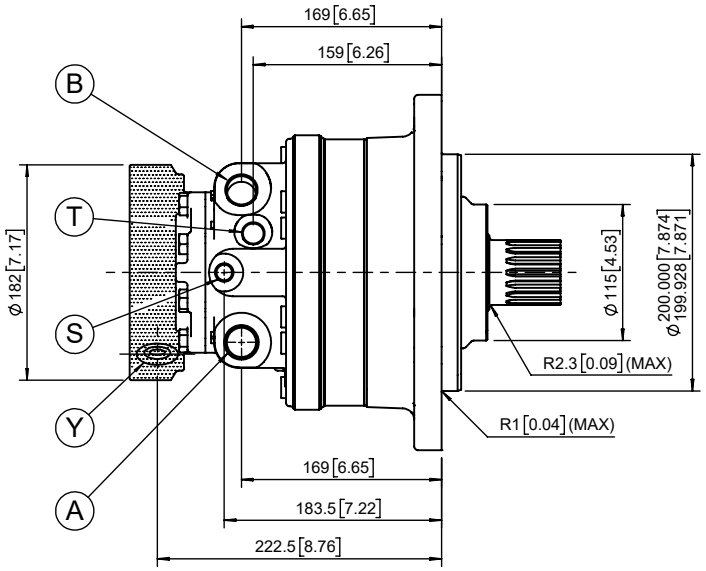


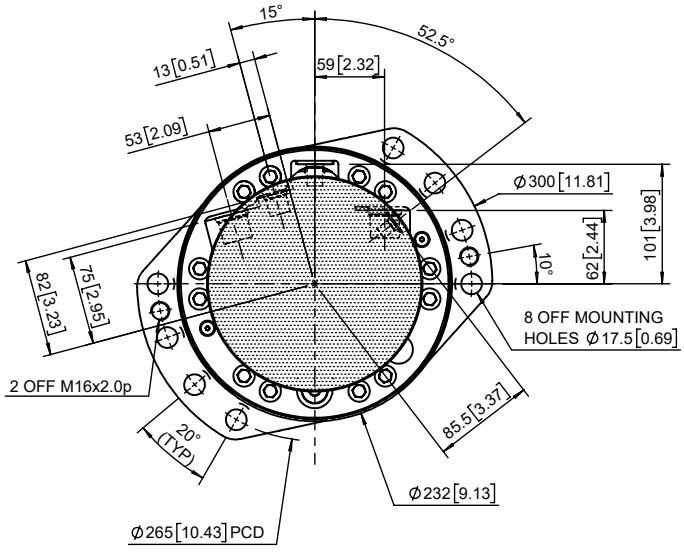
Shaft spline
DIN 5480: W55 x 3 x 30 x 17 x 8f

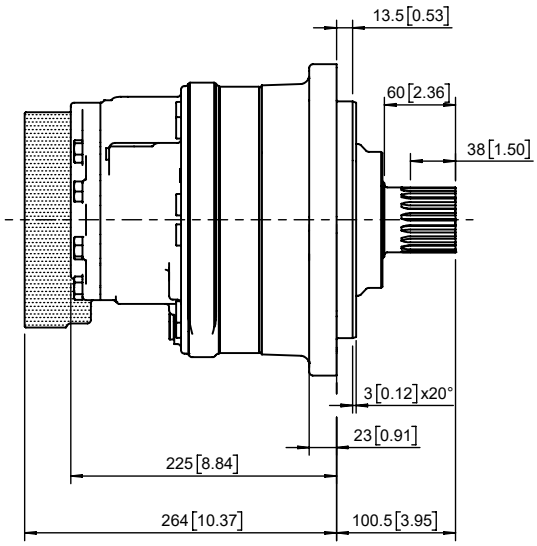
See page 14 for additional shaft options.

See page 23 for hydraulic connection options.









SHAFT MOTOR
OUTPUT OPTIONS

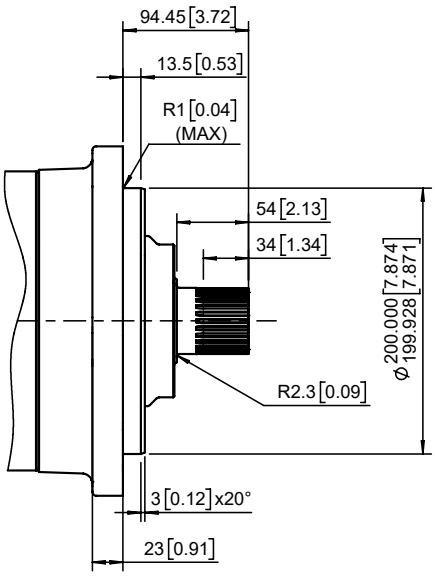
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	08	09	10	11	12	REAR MODULE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3

SPLINE

FRONT MODULE

03	04	05	06	07
S	F	N	1	N

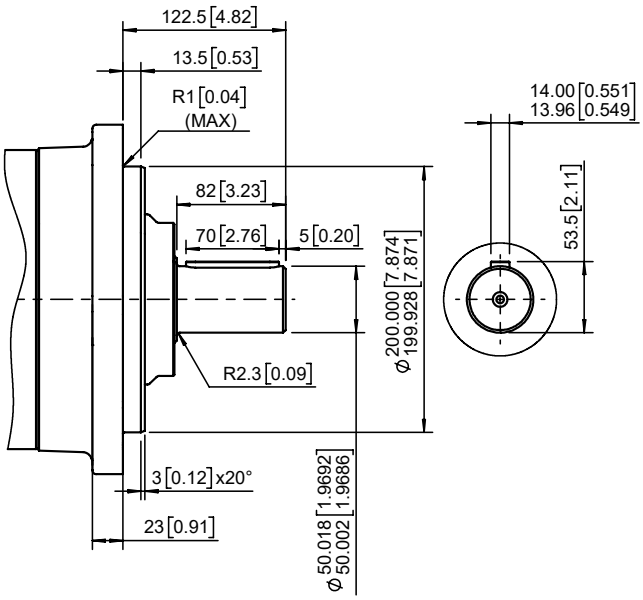
NF E22-141-50 x 28 x 1.667 (Fit 2)		
Nominal Ø	50	[1.97]
Module	1.667	
Number of teeth	28	
Fit	2	



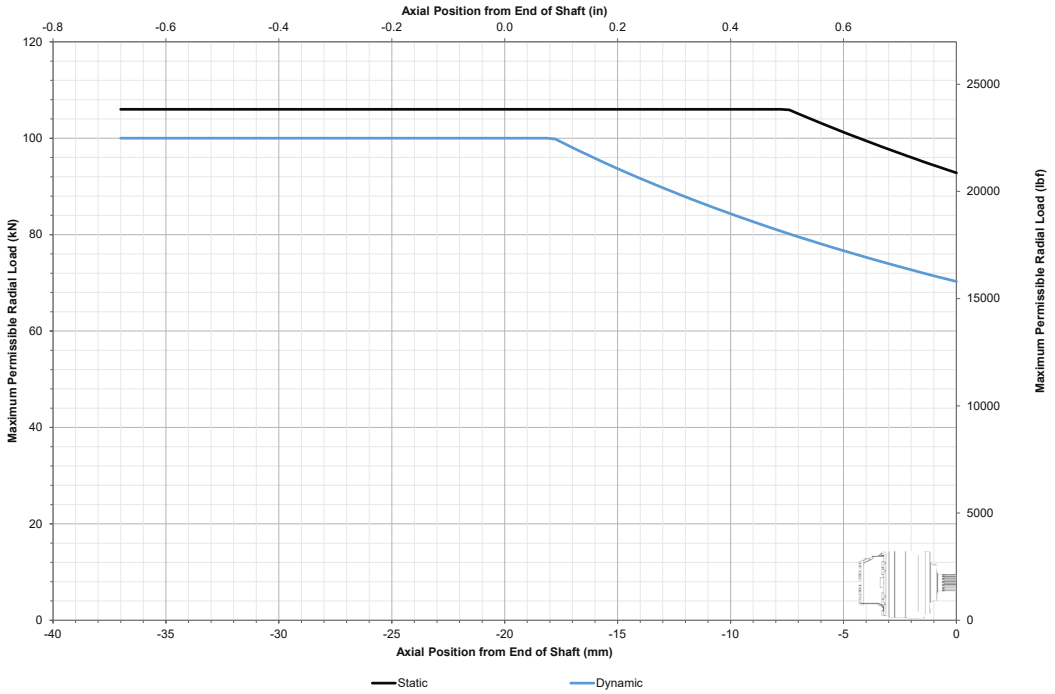
KEYED OUTPUT

FRONT MODULE

03	04	05	06	07
S	A	N	1	N

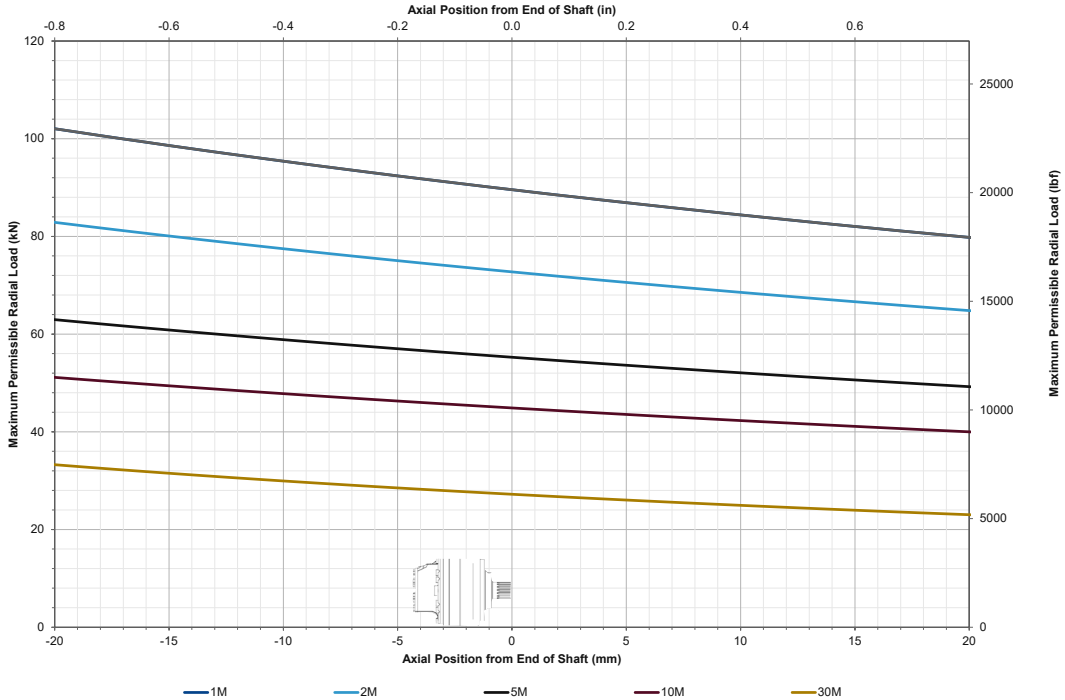


SHAFT MOTOR
PERMISSIBLE DYNAMIC AND STATIC RADIAL LOAD



SHAFT MOTOR
BEARING LIFE UNDER LOAD

The data illustrates the permissible radial load necessary to achieve a specified bearing life. Bearing life is shown in millions of revolutions. Data presented is at 150 bar average pressure, without external axial load.



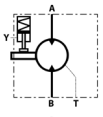
Contact us for alternative duty cycles. All data is based on the standard spline motor output shaft, option D. All data is based on theoretical calculations.

WHEEL MOTOR
SINGLE SPEED OPTION

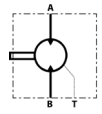
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		W	K	A	1	N	H			N	N					00	A3

(For models shown below)

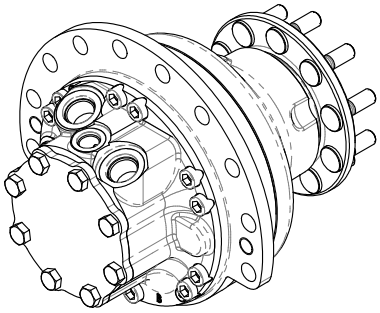
kg 50 kg with brake

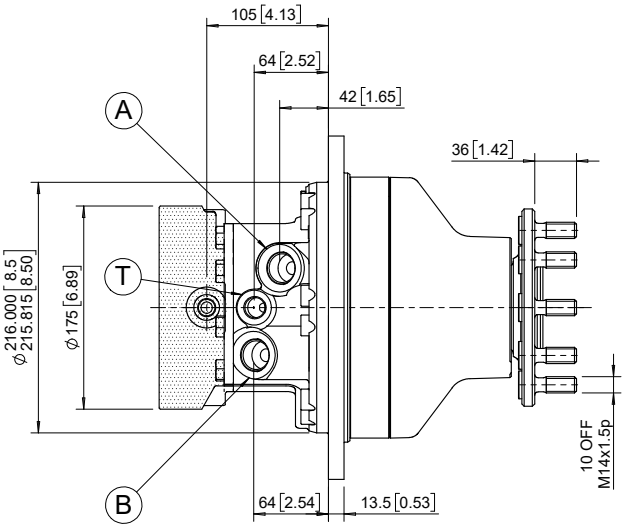


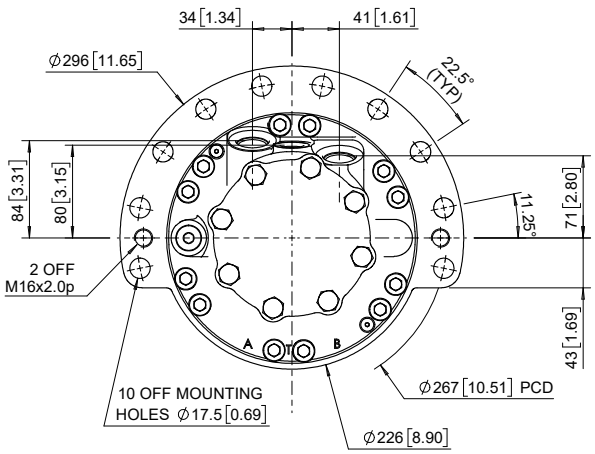
kg 40 kg without brake

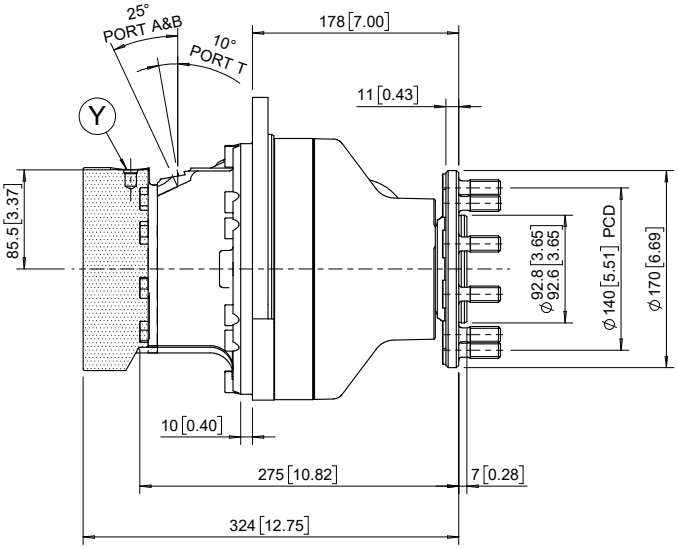


See page 19 for alternate wheel outputs.
See page 23 for hydraulic connection options.









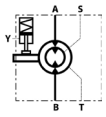
WHEEL MOTOR
TWO SPEED OPTION

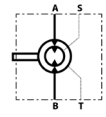
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		W	K	A	1	N	H			N	N					00	A3

(For models shown below)

kg 53 kg with brake

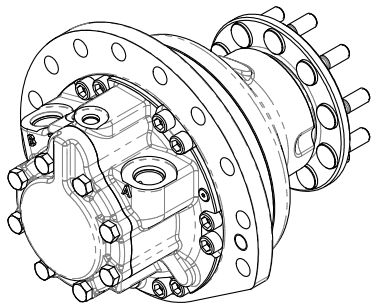
kg 45 kg without brake

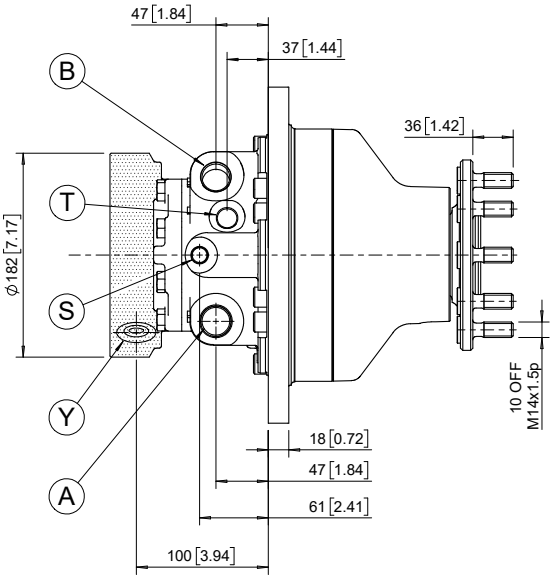


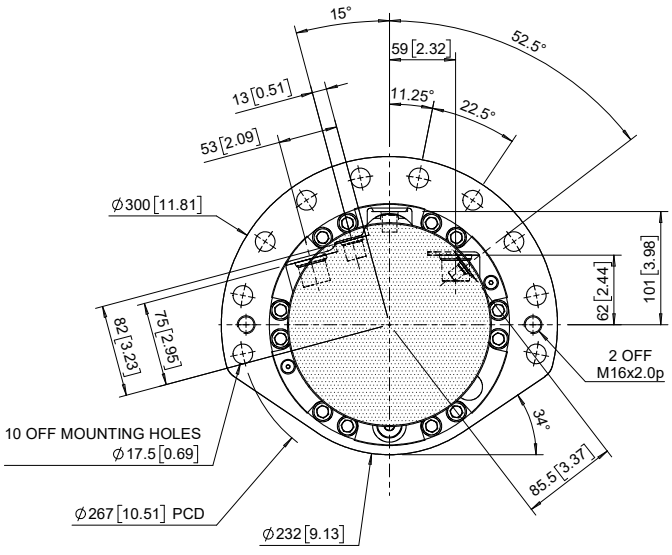


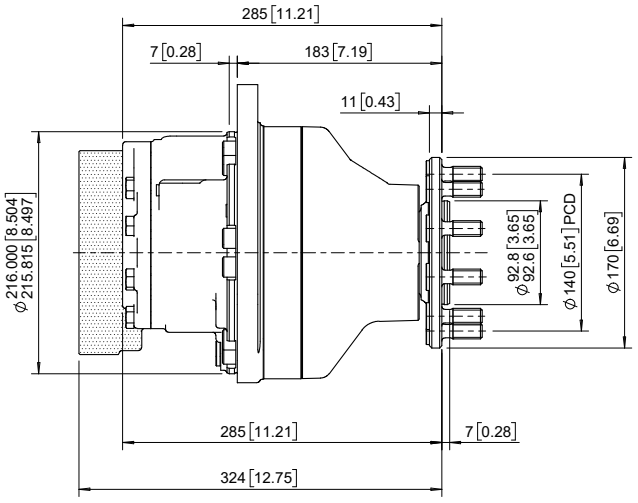
See page 19 for alternate wheel outputs.

See page 23 for hydraulic connection options.









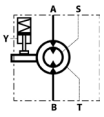
WHEEL MOTOR
TWO SPEED OPTION

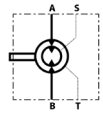
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05		W	K	A	1	N	L			N	N					00	A3

(For models shown below)

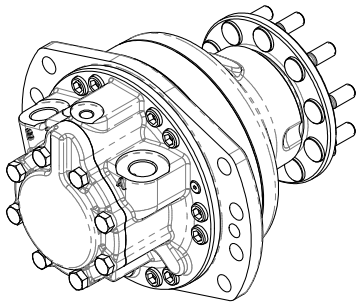
kg 52 kg with brake

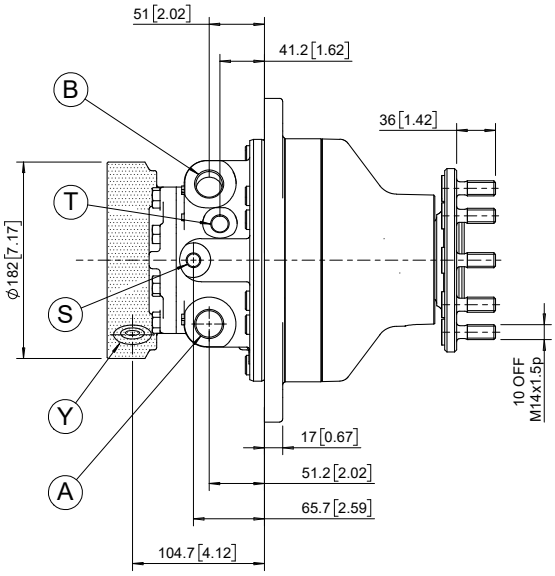
kg 44 kg without brake

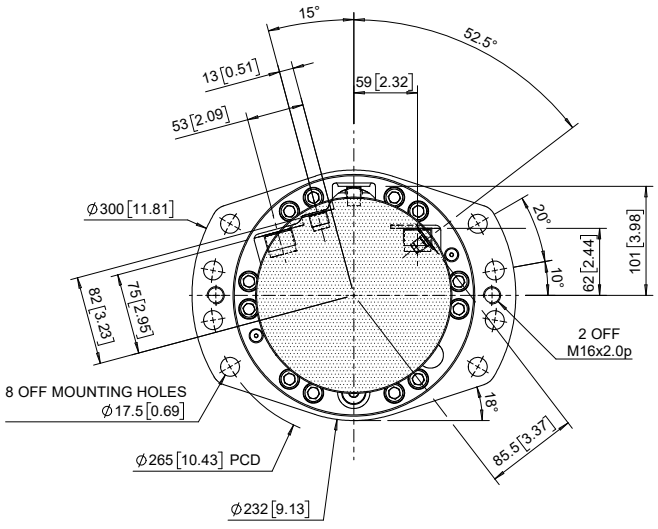


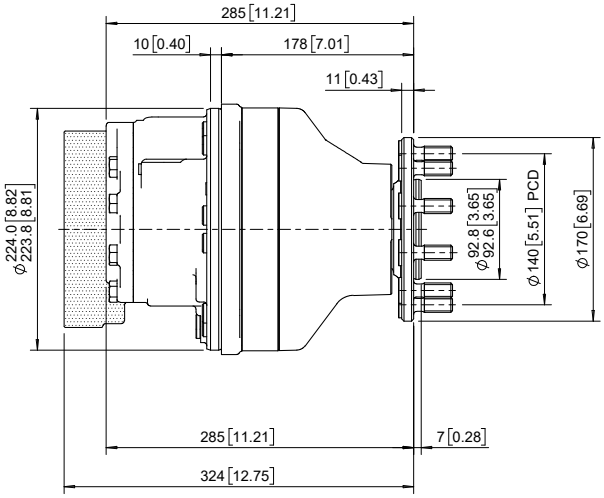


See page 19 for alternate wheel outputs.
See page 23 for hydraulic connection options.



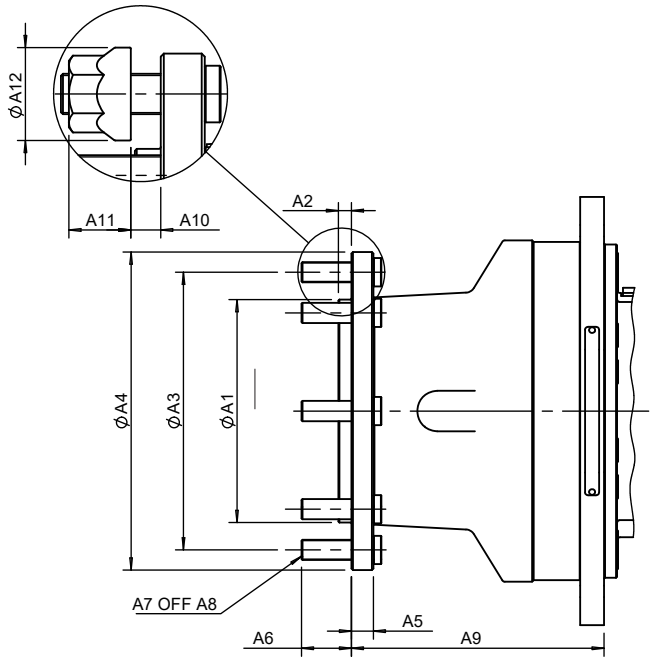






WHEEL MOTOR
OUTPUT OPTIONS

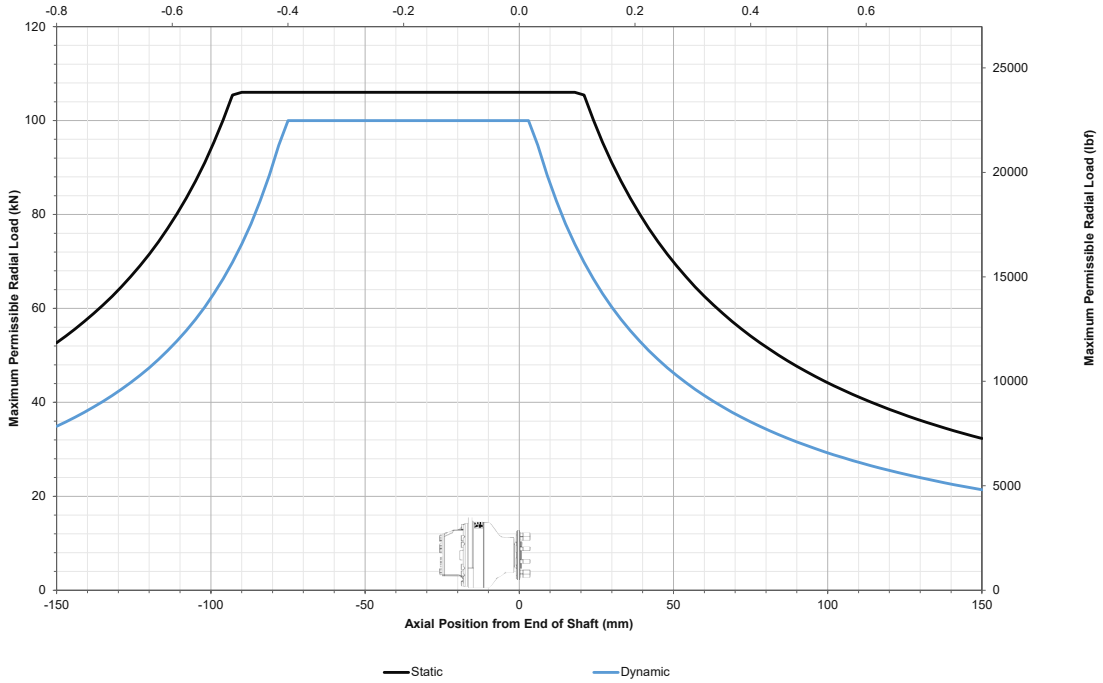
PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3



WHEEL MOTOR - OUTPUT SHAFT

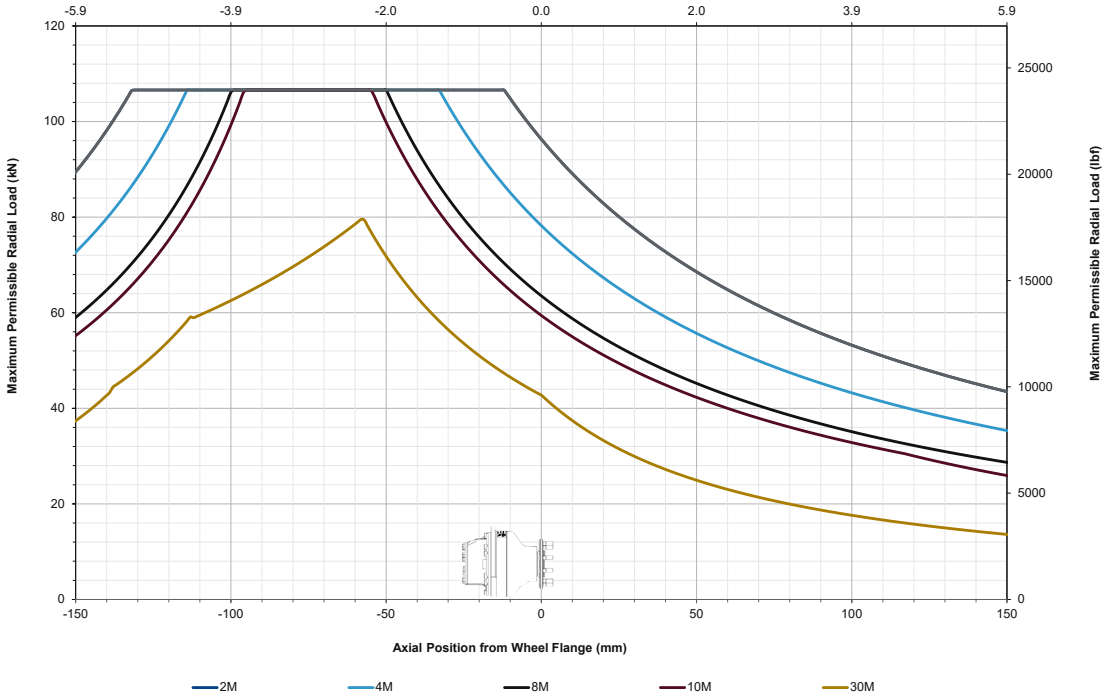
Option		Type	A1	A2	A3	A4	A5	A6	A7	A8	Tightening torque (max)	A9 (Horseshoe)		A9 (Lug)	A10 (min)	A11	A12
03	04											1s	2s	2s only			
W	K	Standard wheel	Ø92.7 [3.65]	7 [0.28]	140 [5.51]	170 [6.69]	13 [0.51]	36 [1.42]	10	M14x1.5p (studs) Ø18.0 (holes) M12 x 1.5p (holes)	200 Nm [147.52] lbf.ft	178 [7.01]	183 [7.20]	178 [7.01]	5 [0.20]	17 [0.67]	32 [1.26]
W	P	Standard wheel	Ø92.7 [3.65]	7 [0.28]	140 [5.51]	170 [6.69]	13 [0.51]	36 [1.42]	5	M14x1.5p (studs) Ø18.0 (holes) M12 x 1.5p (holes)	200 Nm [147.52] lbf.ft	178 [7.01]	183 [7.20]	178 [7.01]	5 [0.20]	17 [0.67]	32 [1.26]
W	L	Large wheel	Ø160.7 [6.33]	14 [0.55]	Ø205 [8.07]	Ø245 [9.65]	13 [0.51]	40 [1.57]	6	M18x1.5p (studs)	420 Nm [309.79] lbf.ft	178 [7.01]	183 [7.20]	178 [7.01]	5 [0.20]	24 [0.94]	40 [1.57]
C	K	Standard wheel	92.7 [3.65]	7 [0.28]	140 [5.51]	180 [7.09]	10.5 [0.41]	32.5 [1.28]	10	M14x1.5p (studs) Ø18.0 (holes) M12 x 1.5p (holes)	200 Nm [147.52] lbf.ft	145.4 [5.72]	150.4 [5.92]	145.4 [5.72]	5 [0.20]	17 [0.67]	32 [1.26]
C	P	Standard wheel	92.7 [3.65]	7 [0.28]	140 [5.51]	180 [7.09]	10.5 [0.41]	32.5 [1.28]	5	M14x1.5p (studs) Ø18.0 (holes) M12 x 1.5p (holes)	200 Nm [147.52] lbf.ft	145.4 [5.72]	150.4 [5.92]	145.4 [5.72]	5 [0.20]	17 [0.67]	32 [1.26]

WHEEL MOTOR
PERMISSIBLE DYNAMIC AND STATIC RADIAL LOAD



WHEEL MOTOR
BEARING LIFE UNDER LOAD

The data illustrates the permissible radial load necessary to achieve a specified bearing life. Bearing life is shown in millions of revolutions. Data presented is at 150 bar average pressure, without external axial load.



Contact us for alternative duty cycles. All data is based on the standard wheel motor output shaft, option K. All data is based on theoretical calculations

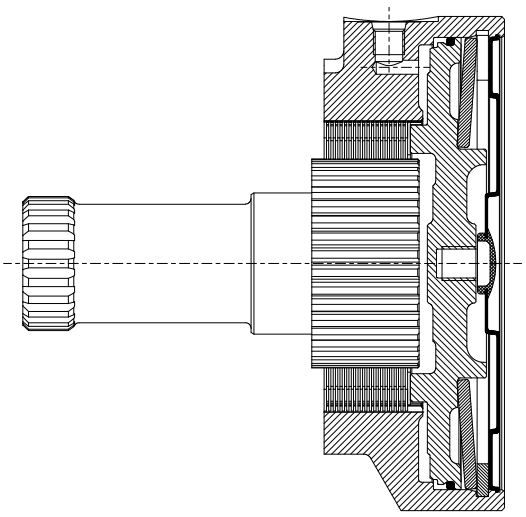
PARKING BRAKES

PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05												R					A3

The XJ05 multi-disc parking brake is a spring applied, hydraulic release, fail safe brake designed to be used with XJ05 motors in static situations.

The multi-disc brake has a modular design which ensures it can be connected to any variant of the XJ05 motor.

The brake has two hydraulic release ports, one at the top of the housing and one at the bottom. The brake can be manually released by removing the plug in the cover and using an M12 screw to pull the piston back.



Brake static capacity when new	4,220 Nm [3,113 lbf.ft]
Static capacity after ten dynamic uses	3,207.2 - 3,671.4 Nm (1)(2)(3) [2,365.5 - 2,707.8 lbf.ft] (1)(2)(3)
Volume to fill	100 cc [6.1 in^3]
Volume to fully release brake	60 cc [3.6 in^3]
Min. pressure to fully release brake	12 bar [174 psi]
Max. acceptable pressure	30 bar [435 psi]
Time to release brake	< 0.5 seconds (4)(5)
Time to engage brake	< 1 second (4)(5)
Emergency release fitting	M12 torqued to 60 Nm [45 lbf.ft]
Weight	10 kg [22 lbs]

(1) Do not run in brake, wearing the plates will reduce the static capacity.
(2) Dynamic use of the brake is not recommended and should only be used in emergency situations.
(3) The disc pack should be replaced after ten dynamic uses.
(4) Times may vary depending on fluid viscosity and valves used.
(5) During low temperature applications, flushing the brake housing is recommended to maintain a constant oil viscosity.
All data is based on ISO46 fluid at 40°C/[122°F]. If a different fluid will be used, please consult Rotary Power.

DIRECTION OF SHAFT ROTATION

PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3

PORT MODULE - SPEED AND ROTATION

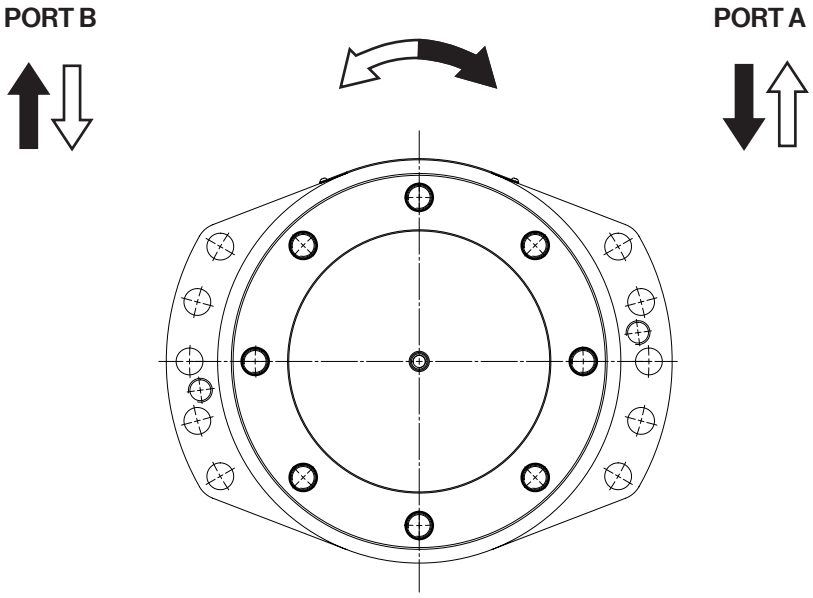
1R	Single speed - flow to port A = CW rotation
1L	Single speed - flow to port A = ACW rotation
RA	Two speed (Ratio 2:1) - flow to port A = CW preferred rotation
LA	Two speed (Ratio 2:1) - flow to port A = ACW preferred rotation

The XJ motor code defines the starting direction of the motor. This is selected by the customer to best suit their application needs.

The starting direction is based on flow being supplied to port A. A single speed motor can have its starting direction reversed by supplying flow to port B.

In two speed motors, pressurising port A is preferred as this prevents the motor from recirculating high pressure oil when shifted into second displacement. It is important to select the correct starting direction of a two speed motor to ensure optimum performance in the required direction.

DIRECTION OF SHAFT ROTATION VIEWED FROM THE SHAFT END



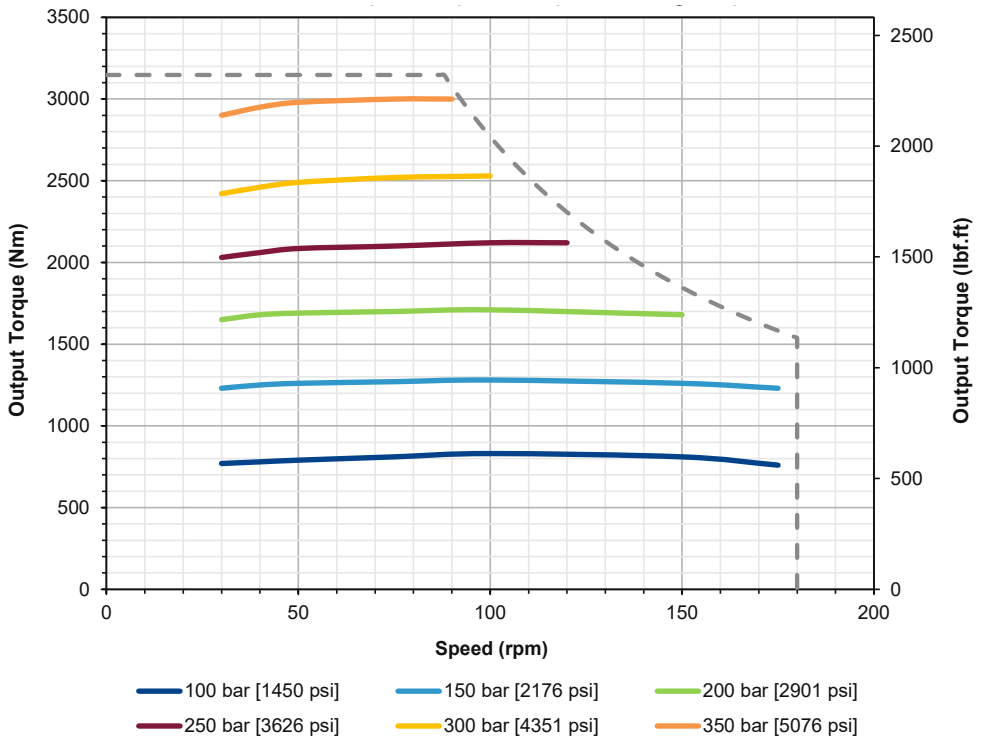
HYDRAULIC CONNECTIONS

PRODUCT 01	CAM 02	FRONT MODULE 03	04	05	06	07	PORT MODULE 08	09	10	11	12	REAR BRAKE 13	OPTIONS 14	15	16	SPECIALS 17	DESIGN 18
XJ05																00	A3

	Port	Power supply		Drain	Speed change	Flushing	Parking brake
		A	B	T	S	F	Y
XJ05 housing options	**1**	3/4" SAE J514 (1-1/16"-12 UNF)		1/2" SAE J514 (3/4"-16 UNF)	3/8" SAE J514 (9/16"-18 UNF)	1/4" SAE J514 (7/16"- 20 UNF)	1/4" SAE J514 (7/16"- 20 UNF)
	3	G 3/4" BSPP		G 3/8" BSPP	G 3/8" BSPP	G 1/4" BSPP	G 1/4" BSPP

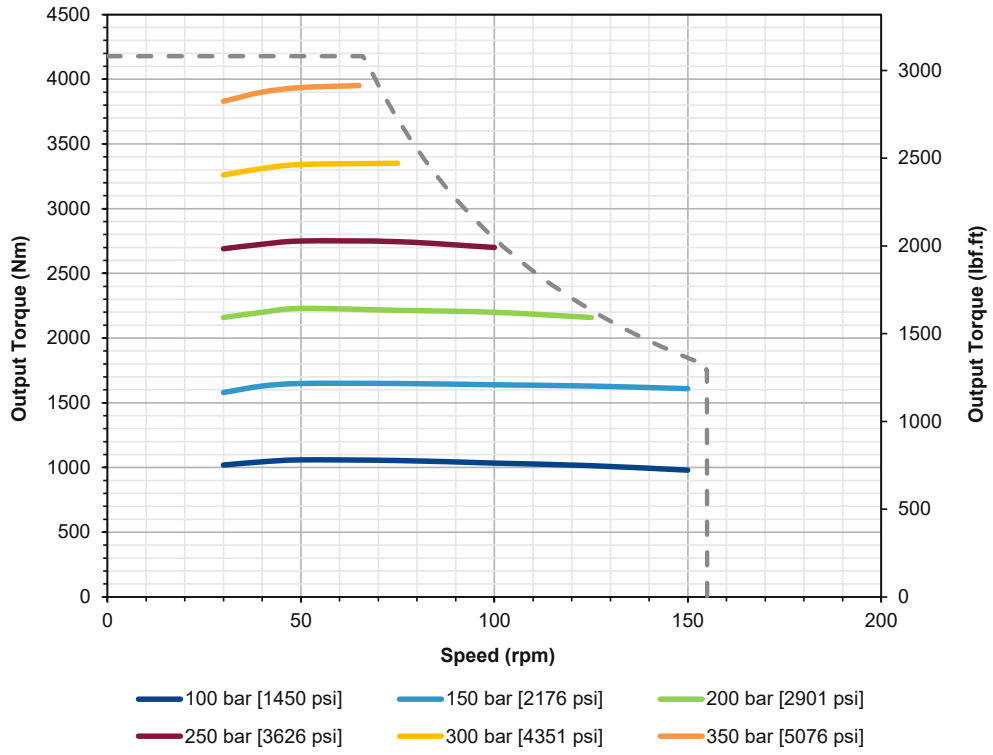
Max. pressures bar [psi]	**Standard Displacements**	450 [6,527]	6 [90]	30 [435]	6 [90]	30 [435]
	Increased Displacements	400 [5,802]	6 [90]	40 [580]	6 [90]	30 [435]

TORQUE OUTPUT
STANDARD DISPLACEMENTS



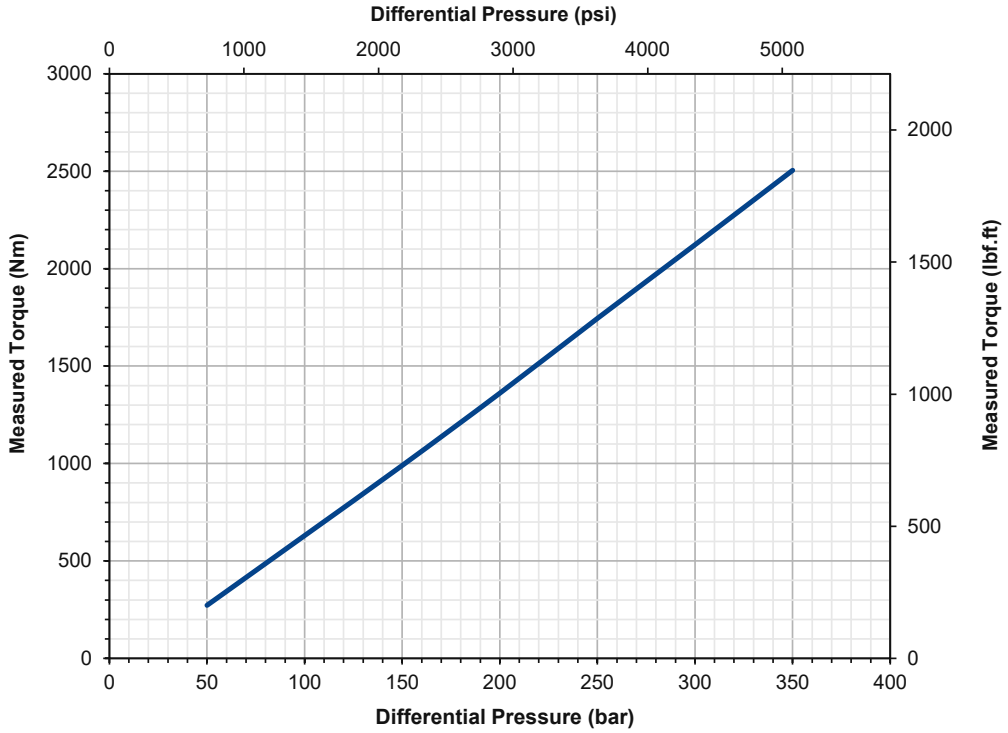
The data presented above was collected using a 560 cc/rev motor with ISO46 fluid at 40°C.
Pressure ranges shown are motor differential pressures (average 20 bar back pressure).

TORQUE OUTPUT
INCREASED DISPLACEMENTS



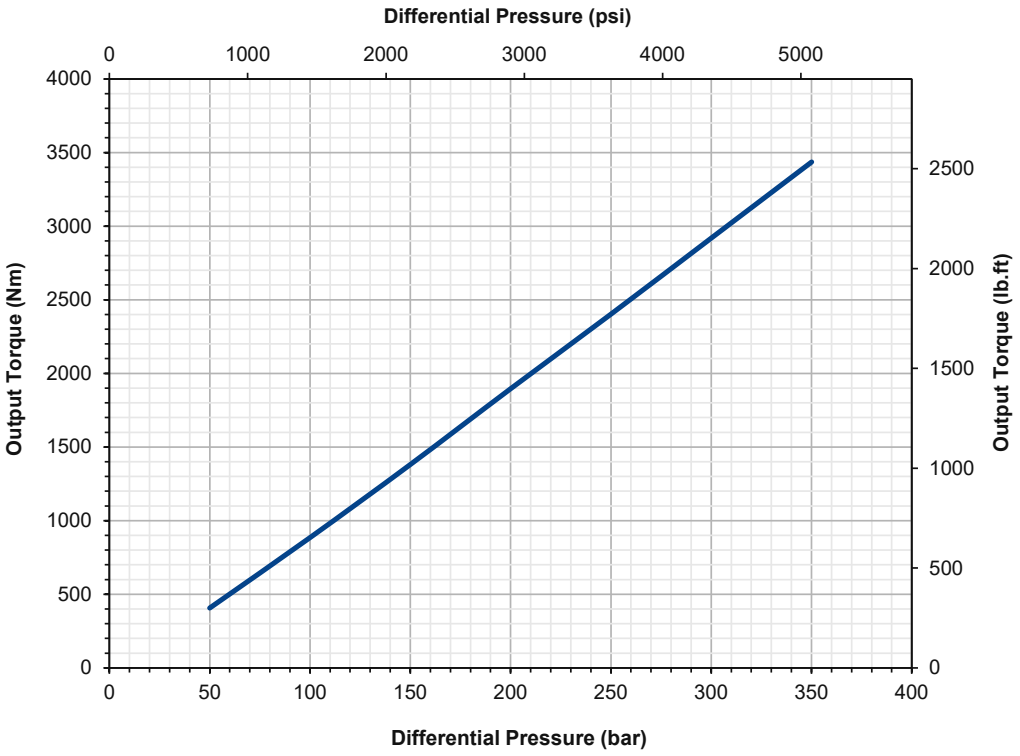
The data presented above was collected using a 750 cc/rev motor with ISO46 fluid at 40°C.
Pressure ranges shown are motor differential pressures (average 20 bar back pressure).

STATIC TORQUE
AVERAGE TORQUE AT ZERO RPM
STANDARD DISPLACEMENTS



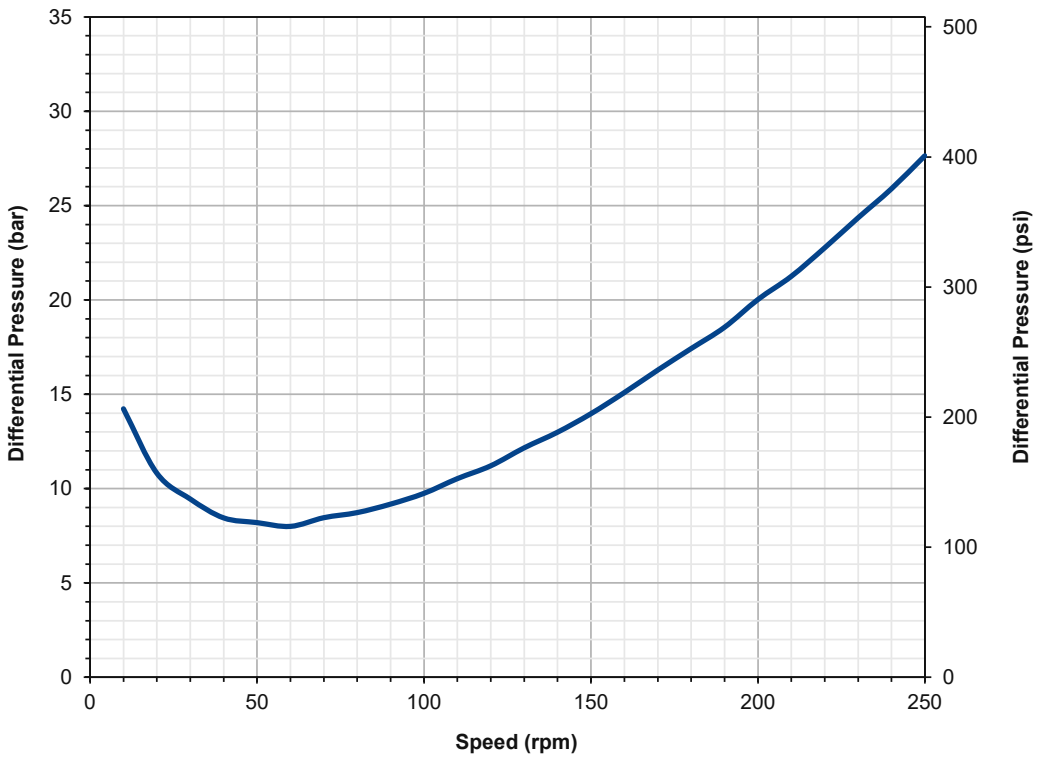
The data presented above was collected using a 560 cc/rev motor with ISO46 fluid at 40°C.
Static torque can vary depending on rotational position of the shaft.

STATIC TORQUE
AVERAGE TORQUE AT ZERO RPM
INCREASED DISPLACEMENTS



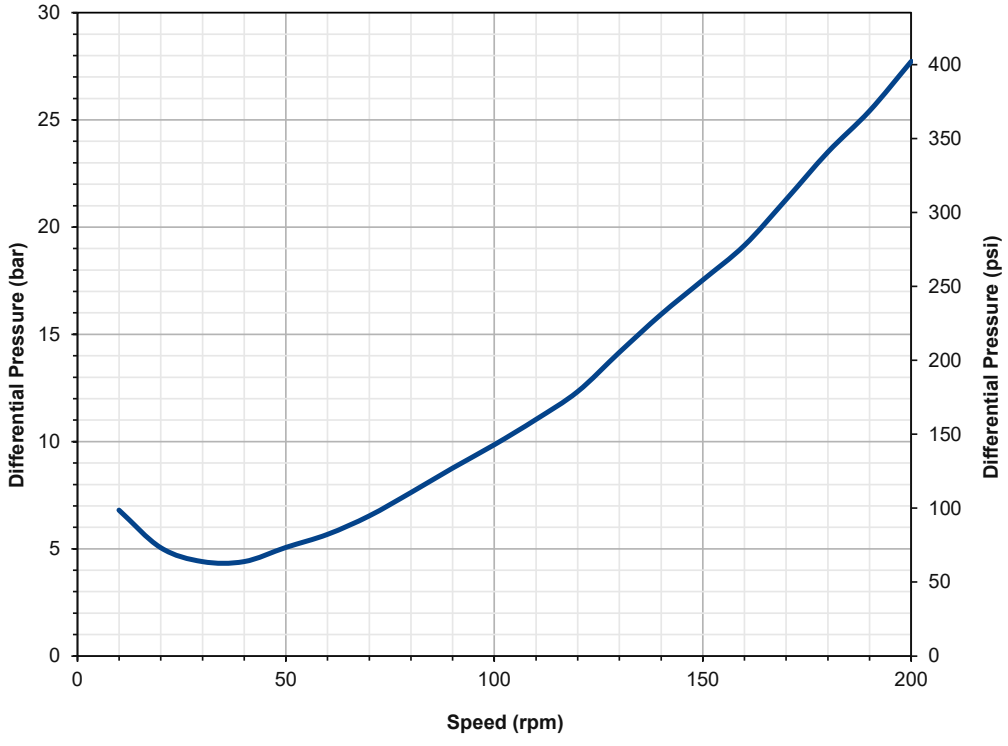
The data presented above was collected using a 750 cc/rev motor with ISO46 fluid at
40°C. Static torque can vary depending on rotational position of the shaft.

NO LOAD PRESSURE DROP
STANDARD DISPLACEMENTS



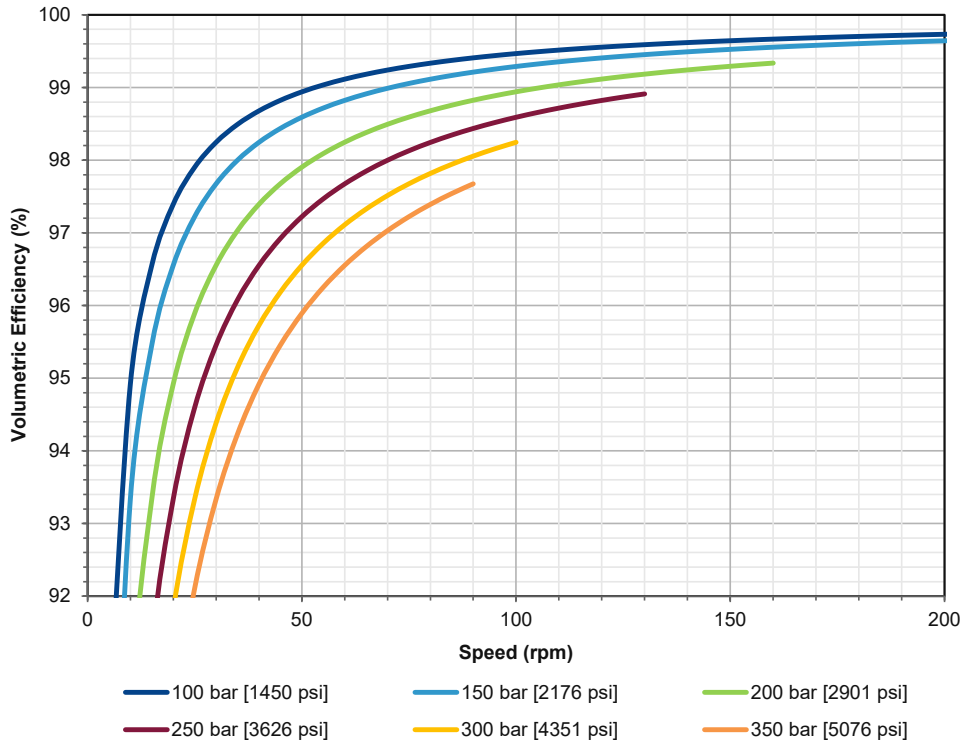
The data presented above was collected using a 560 cc/rev motor with ISO46 fluid at 40°C

NO LOAD PRESSURE DROP
INCREASED DISPLACEMENTS



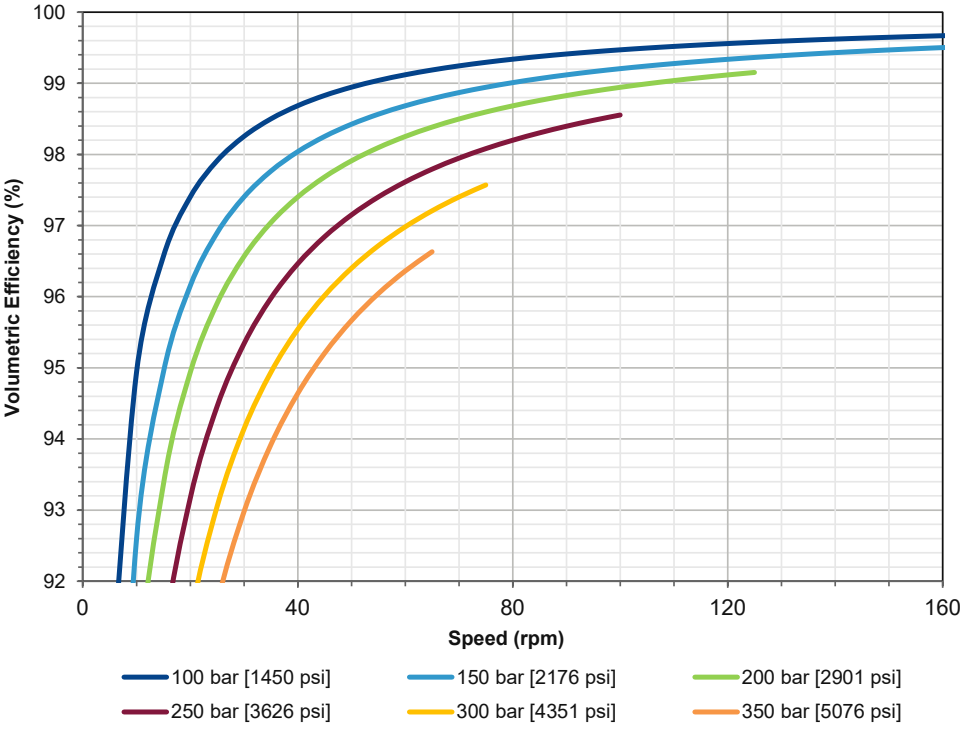
The data presented above was collected using a 750 cc/rev motor with ISO46 fluid at 40°C

VOLUMETRIC EFFICIENCY
STANDARD DISPLACEMENTS



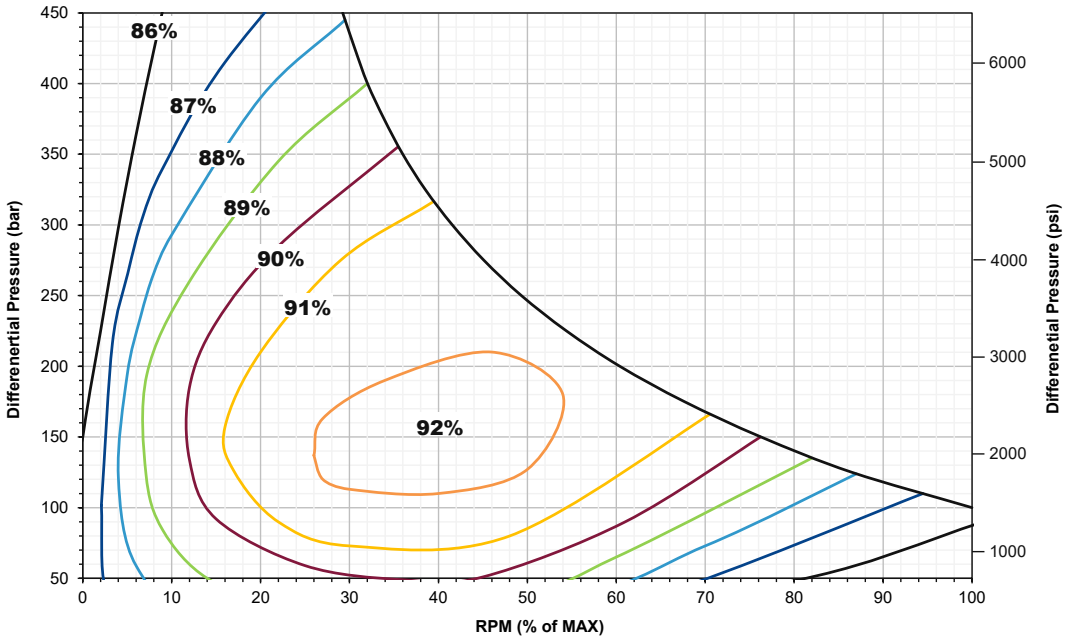
The data presented above was collected using a 560 cc/rev motor with ISO46 fluid at 40°C
Pressure ranges shown are motor differential pressures (average 20 bar back pressure).

VOLUMETRIC EFFICIENCY
INCREASED DISPLACEMENTS



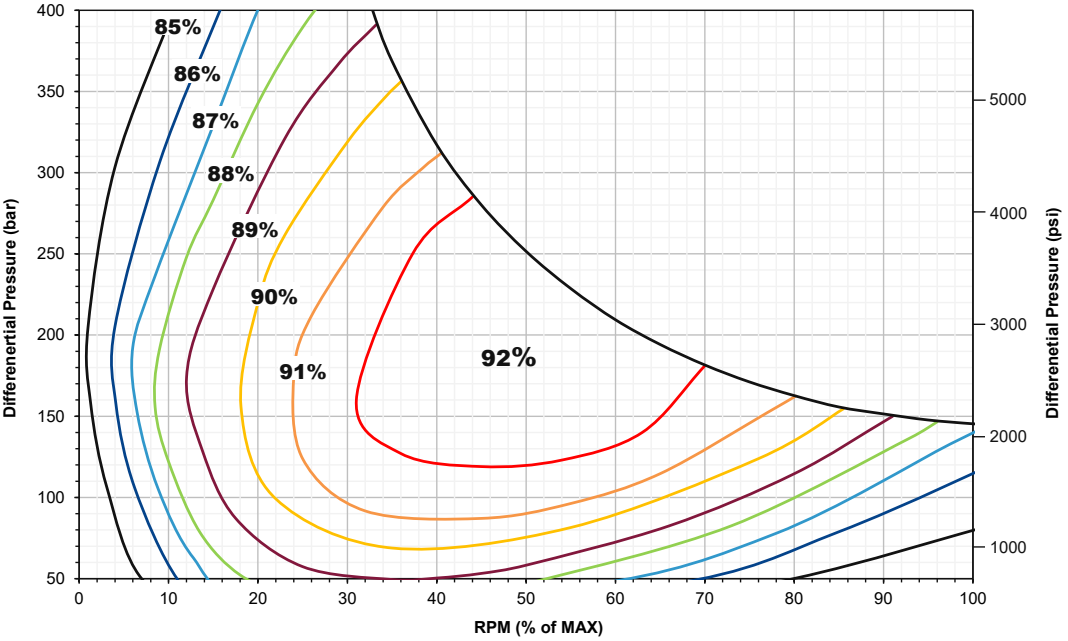
The data presented above was collected using a 750 cc/rev motor with ISO46 fluid at 40°C
Pressure ranges shown are motor differential pressures (average 20 bar back pressure).

OVERALL EFFICIENCY
STANDARD DISPLACEMENTS



The data presented above was collected using a 468 cc/rev motor with ISO46 fluid at 40°C

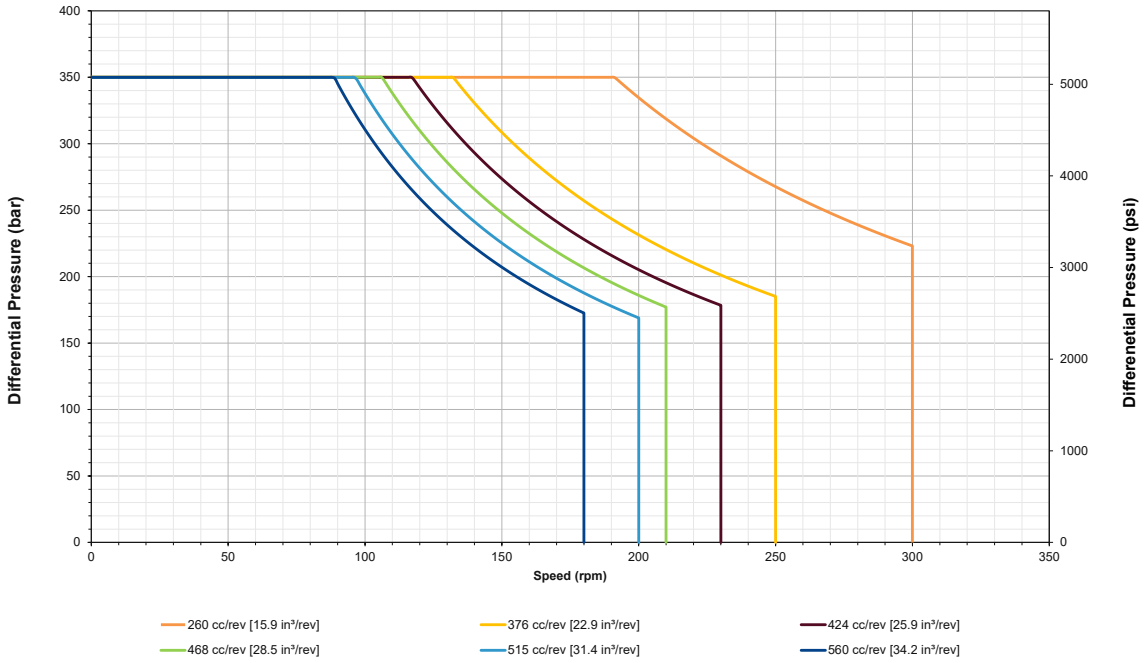
OVERALL EFFICIENCY
INCREASED DISPLACEMENTS



The data presented above was collected using a 625 cc/rev motor with ISO46 fluid at 40°C

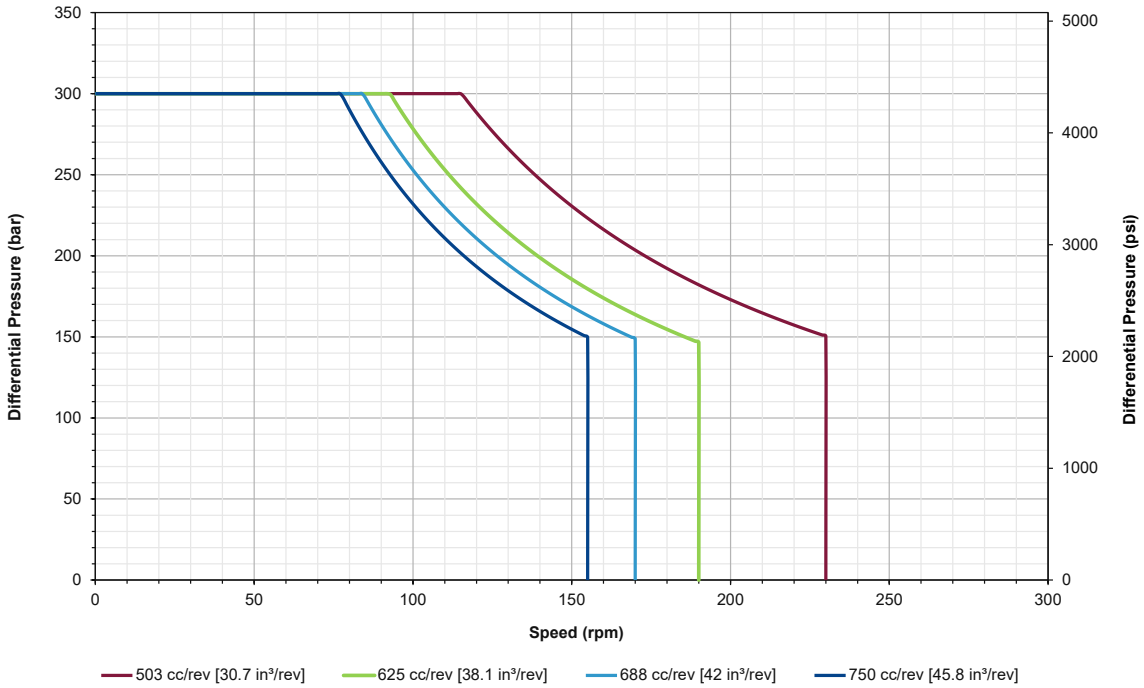
POWER ENVELOPE: STANDARD DISPLACEMENTS

SINGLE SPEED 29KW MAX. CONTINUOUS POWER
MAX DISPLACEMENT



POWER ENVELOPE: INCREASED DISPLACEMENTS

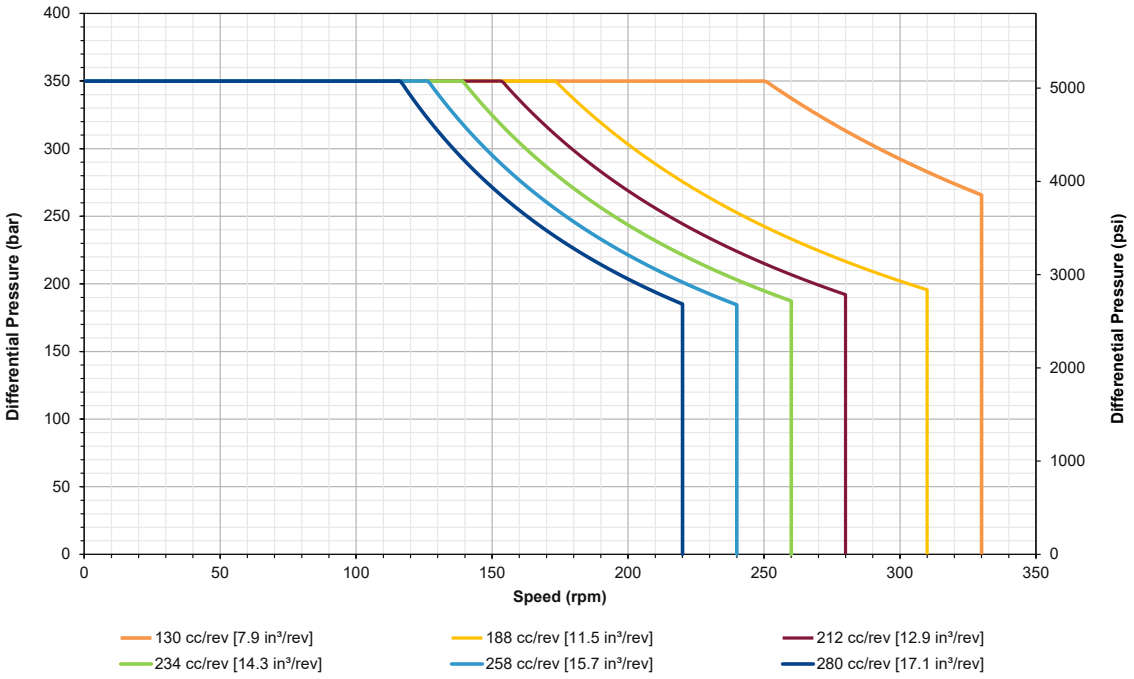
SINGLE SPEED 29KW MAX. CONTINUOUS POWER
MAX DISPLACEMENT



POWER ENVELOPE: STANDARD DISPLACEMENTS

TWO SPEED 19KW MAX. CONTINUOUS POWER

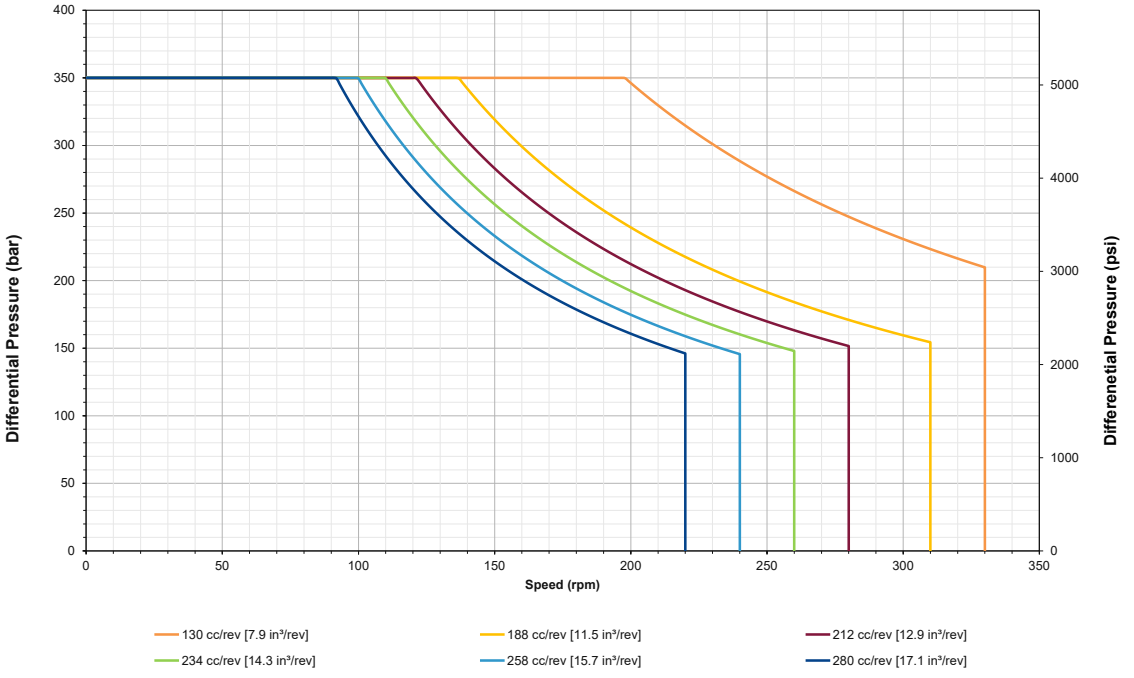
MIN. DISPLACEMENT - PREFERRED DIRECTION



POWER ENVELOPE: STANDARD DISPLACEMENTS

TWO SPEED 15KW MAX CONTINUOUS POWER

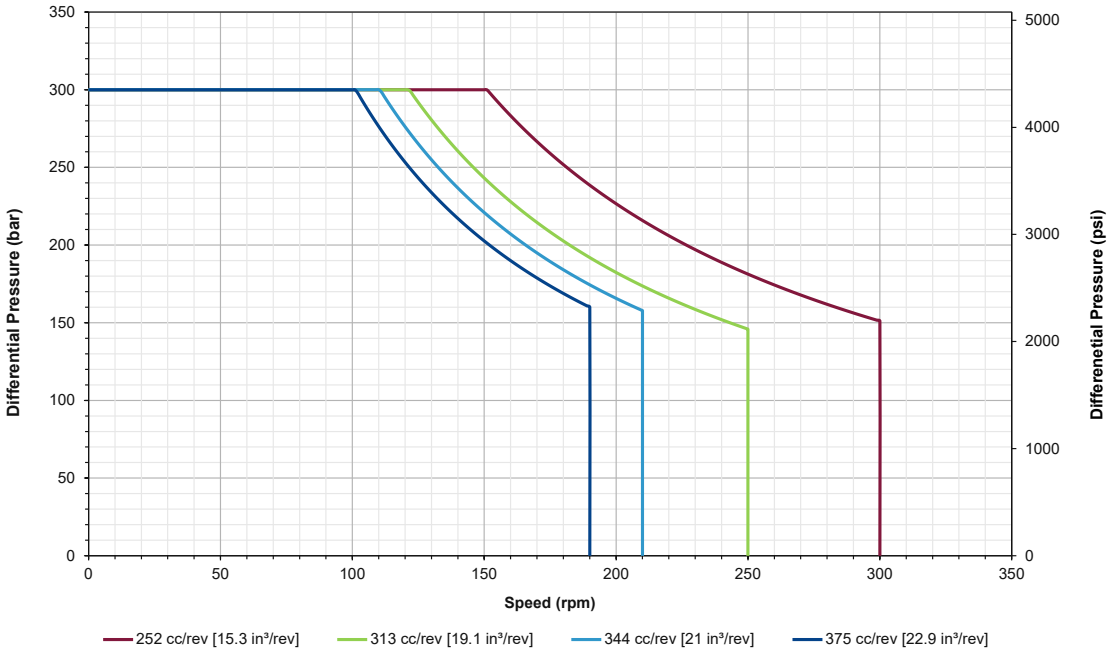
MIN. DISPLACEMENT - NON PREFERRED DIRECTION



POWER ENVELOPE: INCREASED DISPLACEMENTS

TWO SPEED 19KW MAX. CONTINUOUS POWER

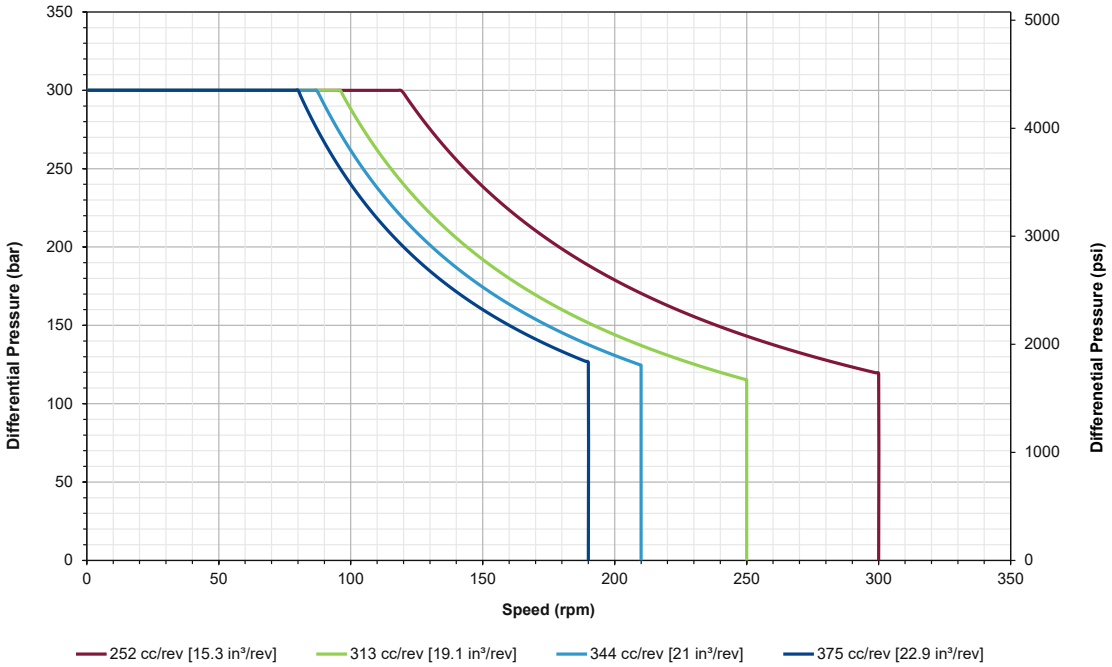
MIN DISPLACEMENT - PREFERRED DIRECTION



POWER ENVELOPE: INCREASED DISPLACEMENTS

TWO SPEED 15KW MAX CONTINUOUS POWER

MIN DISPLACEMENT - NON PREFERRED DIRECTION



CALCULATIONS

$$\text{Output torque (Nm)} = \frac{\text{Motor displacement (cc) x delta pressure (bar) x } \eta m}{20\pi}$$

$$\text{Flow (lpm)} = \frac{\text{Motor displacement (cc) x rotational speed (rpm)}}{1000 \times \eta v}$$

$$\text{Output power (kW)} = \frac{\text{Output torque (Nm) x rotational speed (rpm)}}{9{,}550}$$

Where:
ηm = Mechanical efficiency
ηv = Volumetric efficiency

For approximate estimates of performance use:
ηm = 0.95
ηv = 0.95

CONVERSIONS

Nm → lbf.ft = x 0.7376

N → lbf = x 0.2248

bar → psi = x 14.5038

cc → in^3 = x 0.061

lpm → U.S. gpm = x 0.2641

kW → hp = x 1.341

kg → lb = x 2.2046

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