MSM series



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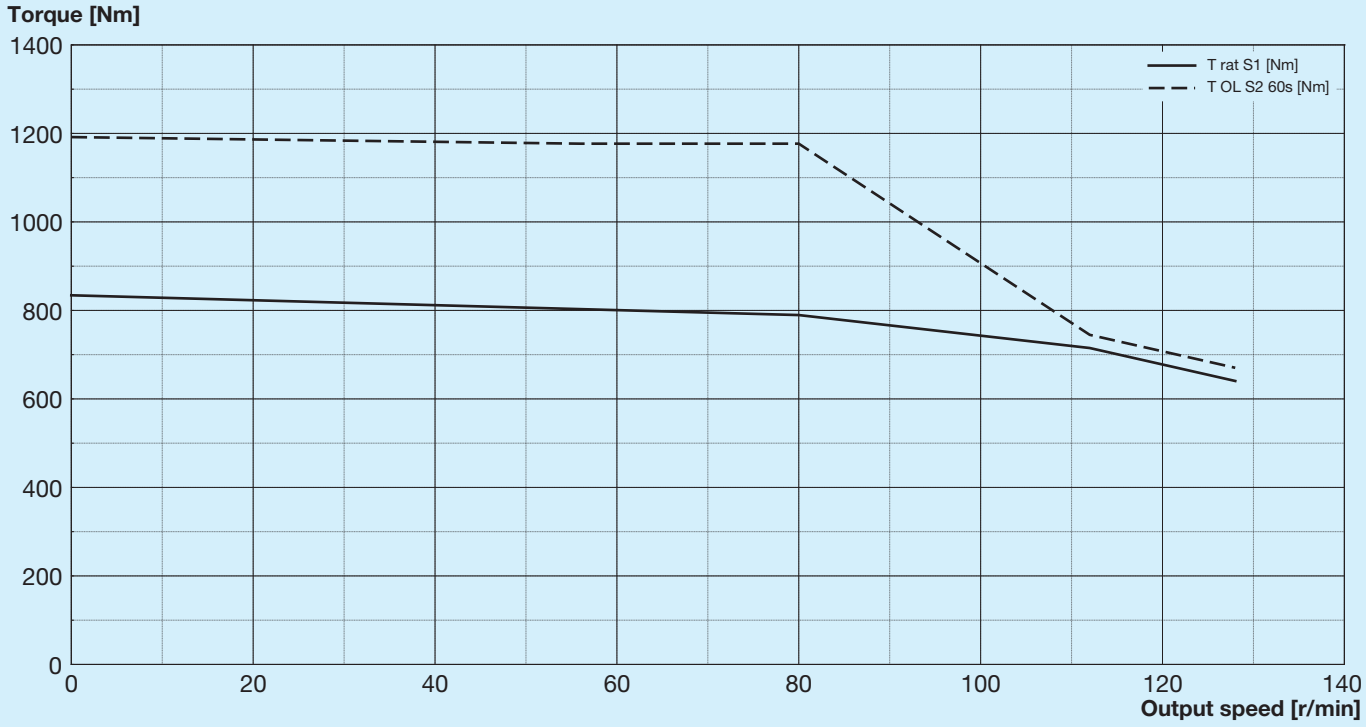


Electric Wheel Hub Motor for Off-Highway Applications

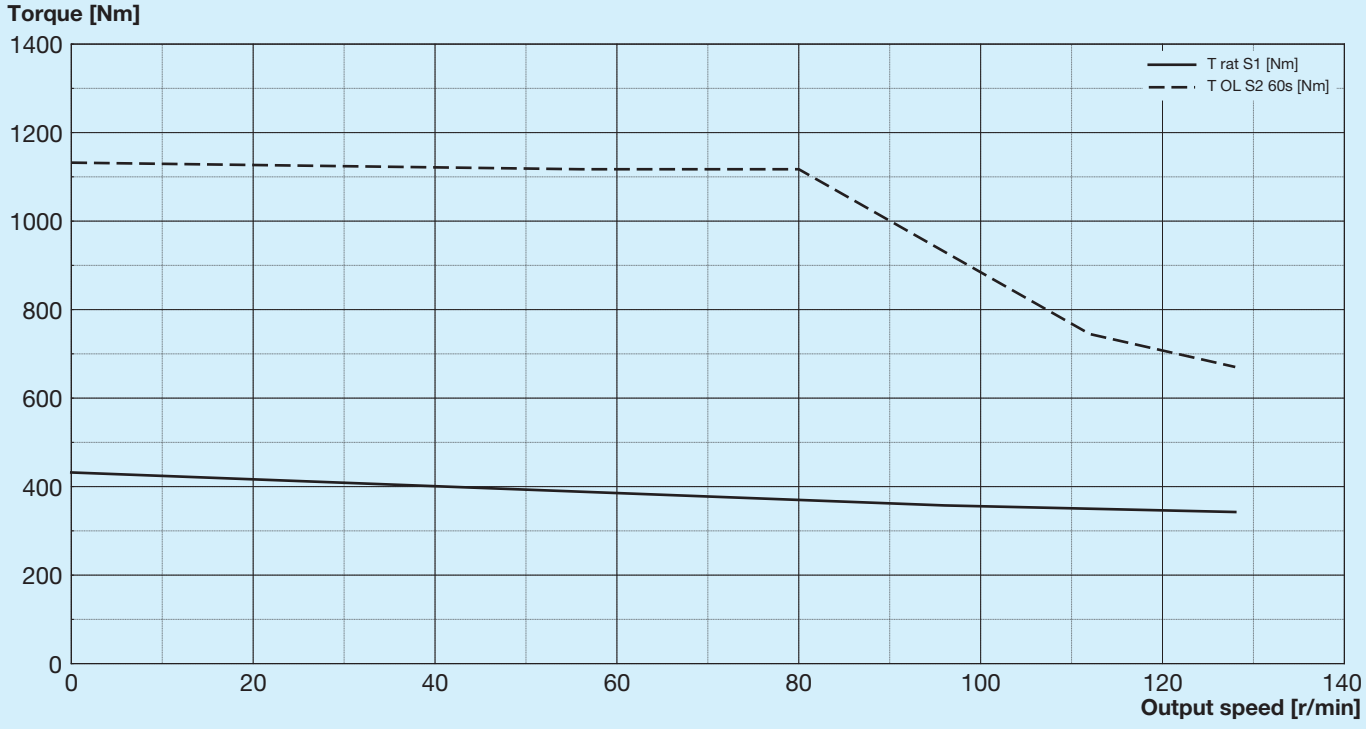
Our **wheel hub motor** combines a high-performance brushless electric motor with an integrated gearbox, specifically designed to accelerate the electrification of the **off-highway sector**.
This innovative solution addresses the growing demand for sustainable mobility across agriculture, municipal vehicles, and construction machinery.
The motor has been **engineered to fit seamlessly inside the wheel**, ensuring maximum space efficiency while delivering **optimal power density**.
Its compact architecture minimizes overall dimensions, offering manufacturers greater freedom in vehicle design without compromising on performance.
To enhance safety and reliability, the unit comes with a **built-in parking brake**, complete with a **mechanical release system** for emergency operation in the event of vehicle failure. This feature ensures uninterrupted functionality even in the toughest working conditions.
Designed for durability, the motor offers **robust construction and a high protection rating**, making it suitable for challenging environments where resistance to dust, water, and extreme conditions is essential.
Operating within a **48V-96V power supply range**, the wheel hub motor is perfectly aligned with the needs of battery-powered equipment, combining efficiency, safety, and versatility.
This product sets a new standard in **electric traction solutions**, helping industries move toward a cleaner, smarter, and more efficient future.

Torque/Speed Characteristics

Liquid Cooling



Air Cooling



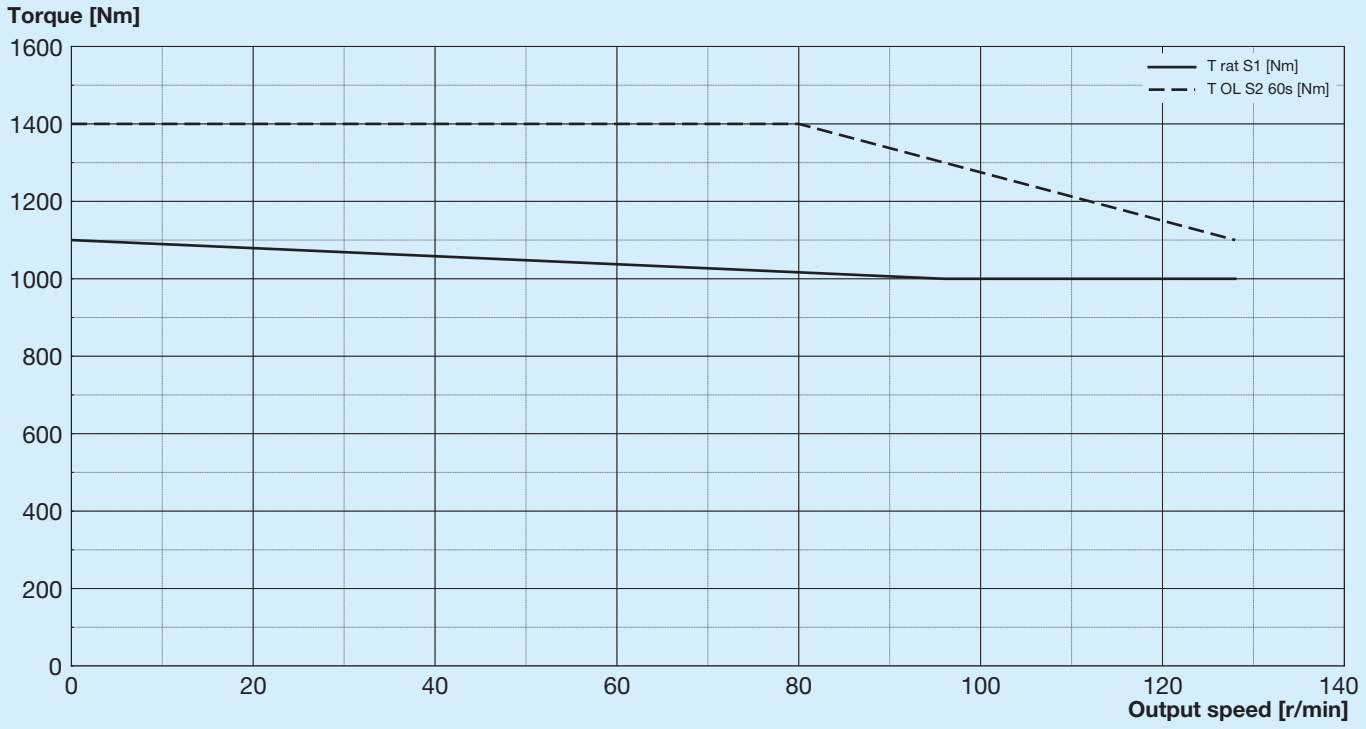
Technical Specifications

Performance and specifications

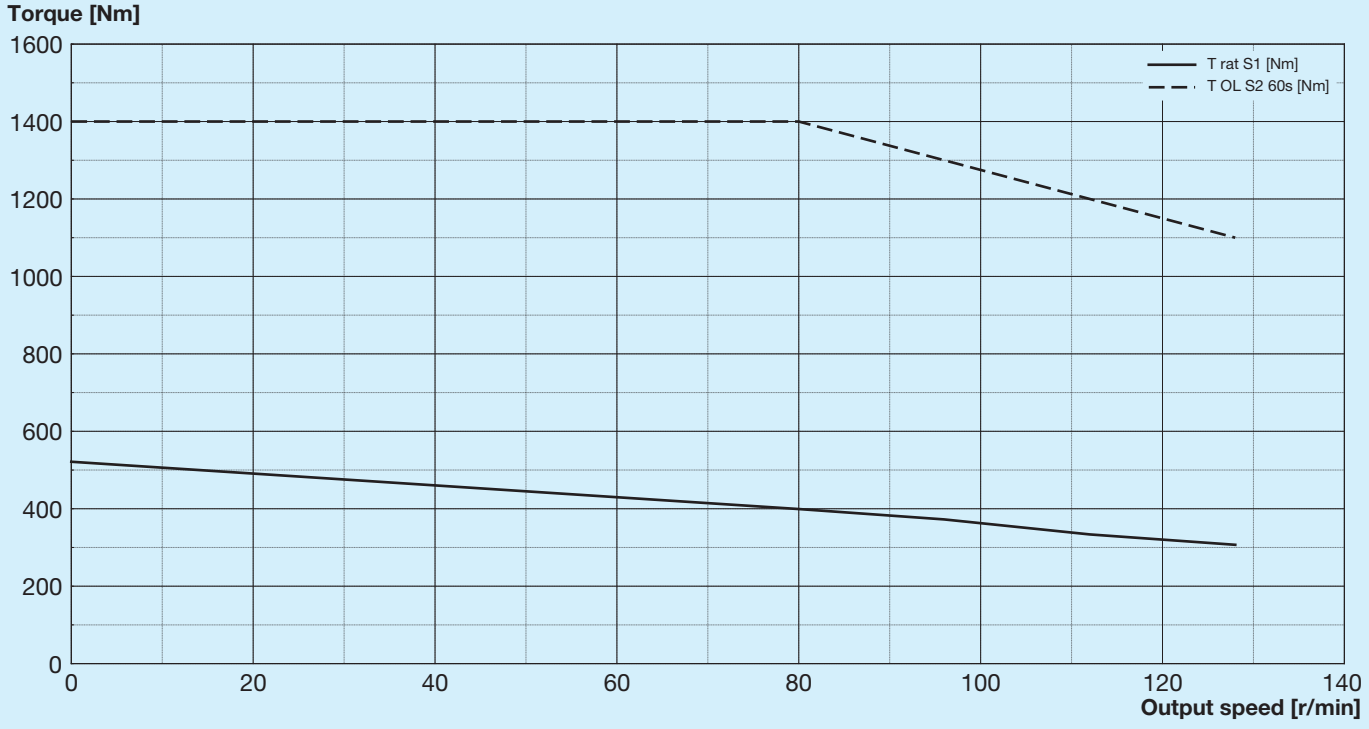
MOTOR MODEL		**MSM 050**			
Reduction ratio		31.36 (3 planet gear)			
Winding code		MSM187A	MSM187B	MSM182A	MSM182B
GENERAL DATA					
Cooling		Liquid		Air	
Voltage Supply	**V_{dc}**	**48**	**96**	**48**	**96**
Stall torque	**Nm**	835		430	
Stall current	**A_{rms}**	209	116	116	58
Rated power	**kW**	8		3,5	
Rated speed	**r/min**	95			
Rated torque	**Nm**	750		350	
Rated current	**A_{rms}**	204	104	102	50
Peak torque	**Nm**	1170		1115	
Peak current	**A_{rms}**	316	166	296	145
Torque costant ±5% (at 25°C)	**Nm/A_{rms}**	3,7	7,4	3,7	7,4
Voltage constant ±5%	**V_{rms}/[k(r/min)]**	8	14,6	8	14,6
Winding Resistance Phase Phase ±5% (at 25°C)	**ohm**	8,6	28,5	8,6	28,5
Winding Inductance Phase Phase ±5%	**mH**	0,1	0,358	0,1	0,358
Pole number		10			
ΔT_{MAX} Winding	**°C**	105			
MECHANICAL DATA					
Mineral gearbox oil type		ISO VG 150/220 EP			
Mineral gearbox oil quantity	**ml**	400			
Weight	**kg**	35,5			
PARKING BRAKE (option)					
Rated voltage +6 / -10%	**V_{dc}**	24			
Rated current at 20°C	**A**	1,1			
Weight	**Kg**	1,6			
Holding torque	**Nm**	1100			
ROTOR POSITION SENSOR SIN-COS (single ended)					
Supply	**V**	5V +/- 5%			
Max current consumption	**mA**	30			
Internal serial impedence	**Ohm**	100			
Amplitude	**V**	2.2 +/- 0.2 Vpp			
Signal offset	**V**	2.5 +/- 1%			
THERMAL SENSOR PT1000					
Type		PT1000-R8/2-2F			
Resistence at 20° / Resistance at 100°	**Ohm**	1078 / 1385			
Precision	**°C**	+/- (0.3-0.005t)			

Torque/Speed Characteristics

Liquid Cooling



Air Cooling

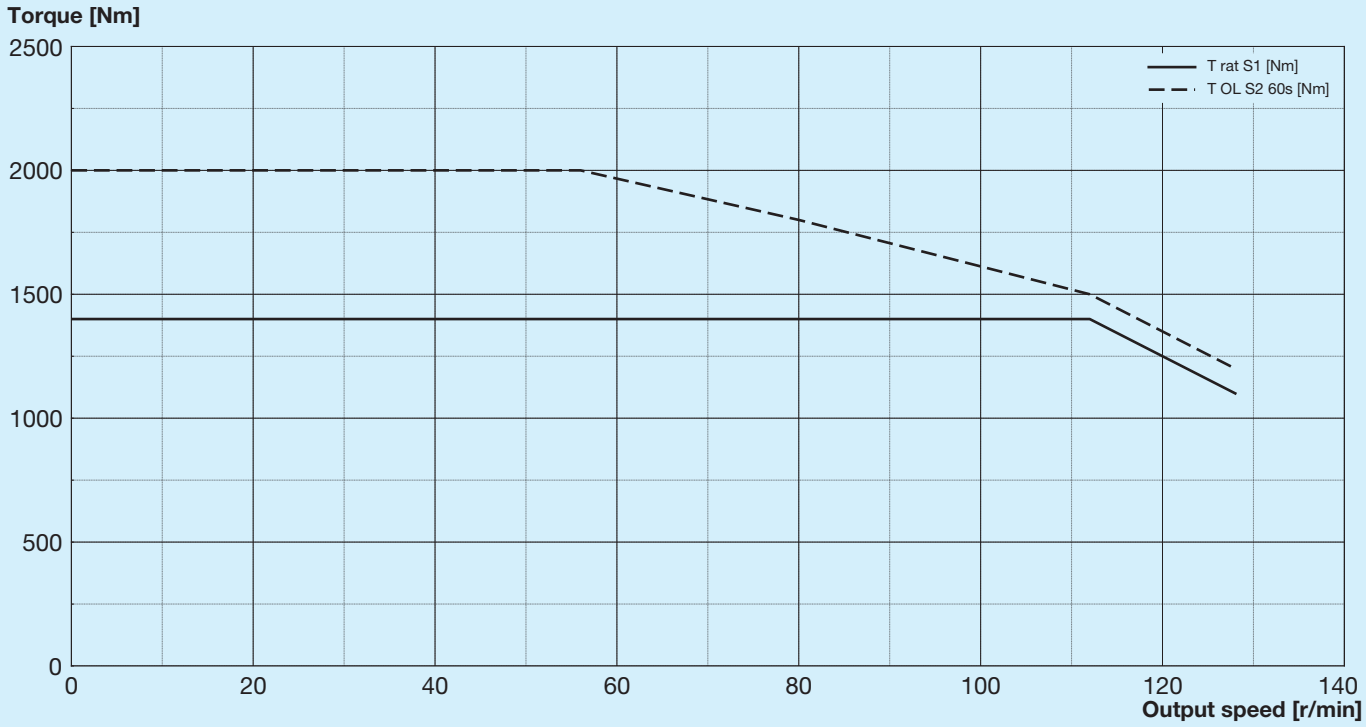


Performance and specifications

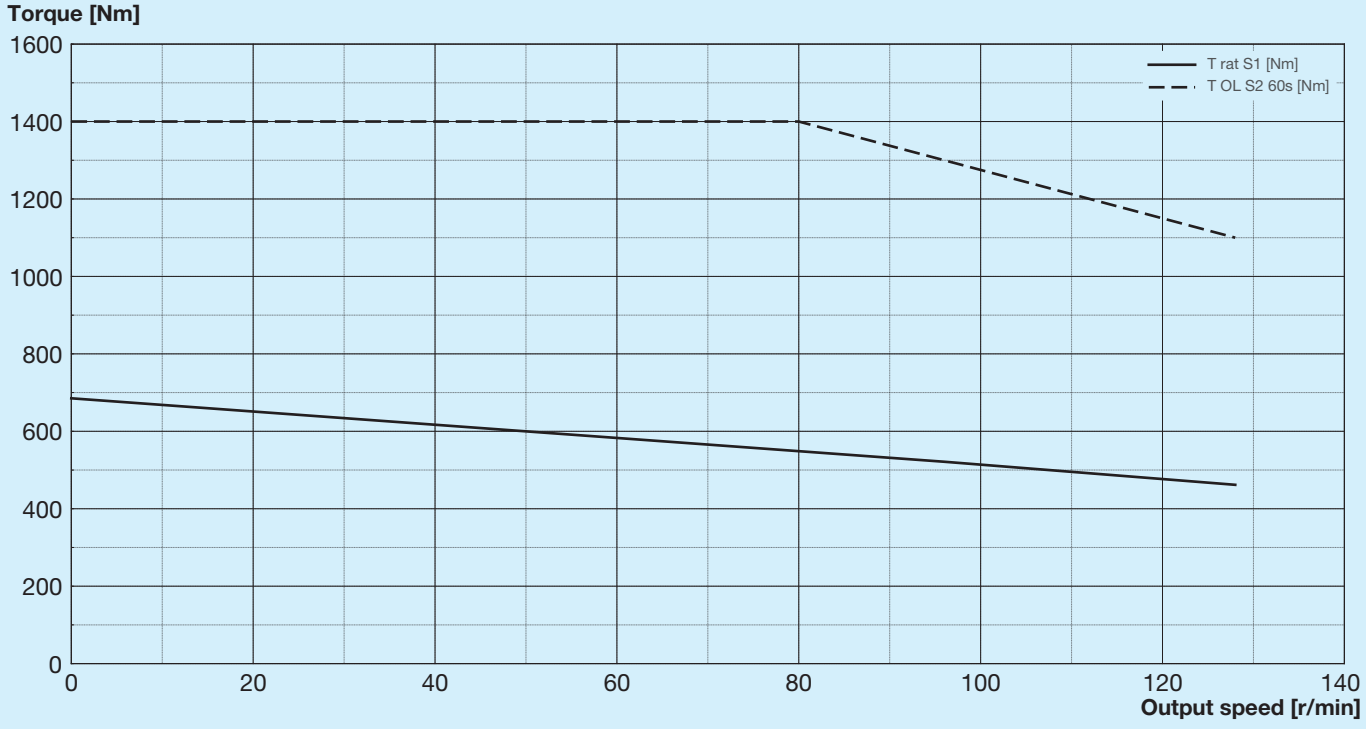
MOTOR MODEL		MSM 075			
Reduction ratio		31.36 (4 planet gear)		31.36 (3 planet gear)	
Winding code		MSM188A	MSM188B	MSM183A	MSM183B
GENERAL DATA					
Cooling		Liquid		Air	
Voltage Supply	**V_{dc}**	**48**	**96**	**48**	**96**
Stall torque	**Nm**	1100		520	
Stall current	**A_{rms}**	295	148	150	70
Rated power	**kW**	11		4	
Rated speed	**r/min**	96			
Rated torque	**Nm**	1000		370	
Rated current	**A_{rms}**	314	135	111	50
Peak torque	**Nm**	1400			
Peak current	**A_{rms}**	390	189	390	190
Torque costant ±5% (at 25°C)	**Nm/A_{rms}**	3,7	7,4	3,7	7,4
Voltage constant ±5%	**V_{rms}/[k(r/min)]**	7,75	15,9	7,75	15,9
Winding Resistance Phase Phase ±5% (at 25°C)	**ohm**	4,9	20,6	4,9	20,6
Winding Inductance Phase Phase ±5%	**mH**	0,06	0,284	0,06	0,284
Pole number		10			
ΔT_{MAX} Winding	**°C**	105			
MECHANICAL DATA					
Mineral gearbox oil type		ISO VG 150/220 EP			
Mineral gearbox oil quantity	**ml**	400			
Weight	**kg**	41		40	
PARKING BRAKE (option)					
Rated voltage +6 / -10%	**V_{dc}**	24			
Rated current at 20°C	**A**	1,1			
Weight	**Kg**	1,6			
Holding torque	**Nm**	1100			
ROTOR POSITION SENSOR SIN-COS (single ended)					
Supply	**V**	5V +/- 5%			
Max current consumption	**mA**	30			
Internal serial impedence	**Ohm**	100			
Amplitude	**V**	2.2 +/- 0.2 Vpp			
Signal offset	**V**	2.5 +/- 1%			
THERMAL SENSOR PT1000					
Type		PT1000-R8/2-2F			
Resistence at 20° / Resistance at 100°	**Ohm**	1078 / 1385			
Precision	**°C**	+/- (0.3-0.005t)			

Torque/Speed Characteristics

Liquid Cooling



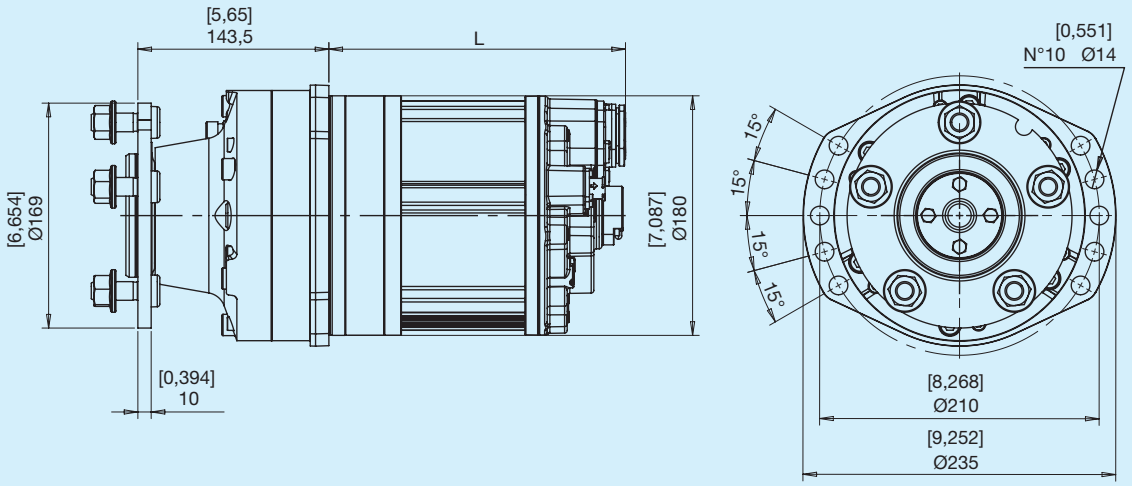
Air Cooling



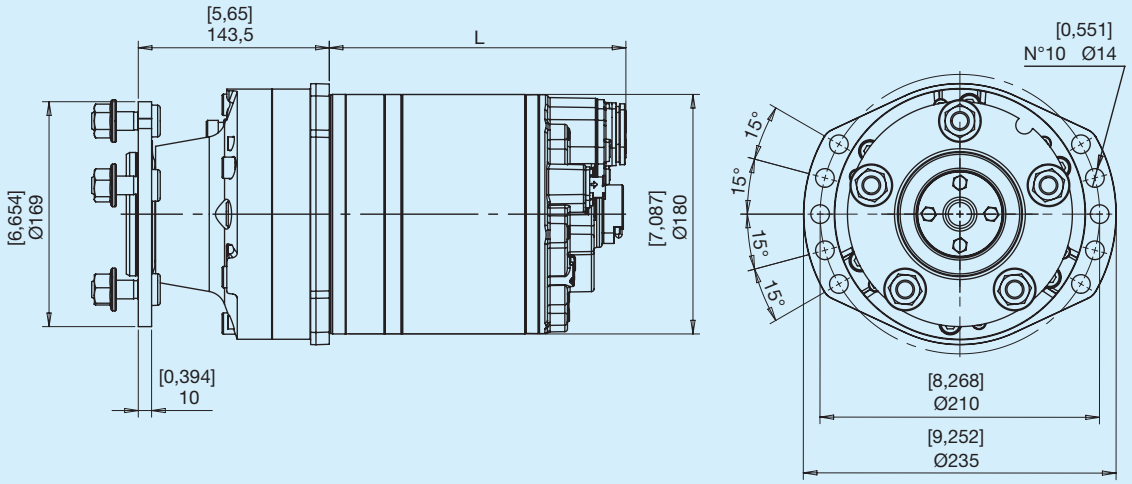
Performance and specifications

MOTOR MODEL		**MSM 100**			
Reduction ratio		31.36 (4 planet gear)		31.36 (3 planet gear)	
Winding code		MSM189A	MSM189B	MSM184A	MSM184B
GENERAL DATA					
Cooling		Liquid		Air	
Voltage Supply	**V_{dc}**	**48**	**96**	**48**	**96**
Stall torque	**Nm**	1400		680	
Stall current	**A_{rms}**	350	190	183	90
Rated power	**kW**	16		5,5	
Rated speed	**r/min**	96			
Rated torque	**Nm**	1400		520	
Rated current	**A_{rms}**	350	190	147	70
Peak torque	**Nm**	2000		1400	
Peak current	**A_{rms}**	540	270	360	190
Torque costant ±5% (at 25°C)	**Nm/A_{rms}**	3,7	7,4	3,7	7,4
Voltage constant ±5%	**V_{rms}/[k(r/min)]**	8,25	15,9	8,25	15,9
Winding Resistance Phase Phase ±5% (at 25°C)	**ohm**	3,8	13,9	3,8	13,9
Winding Inductance Phase Phase ±5%	**mH**	0,05	0,204	0,05	0,204
Pole number		10			
ΔT_{MAX} Winding	**°C**	105			
MECHANICAL DATA					
Mineral gearbox oil type		ISO VG 150/220 EP			
Mineral gearbox oil quantity	**ml**	400			
Weight	**kg**	44		43	
PARKING BRAKE (option)					
Rated voltage +6 / -10%	**V_{dc}**	24			
Rated current at 20°C	**A**	1,1			
Weight	**Kg**	1,6			
Holding torque	**Nm**	1100			
ROTOR POSITION SENSOR SIN-COS (single ended)					
Supply	**V**	5V +/- 5%			
Max current consumption	**mA**	30			
Internal serial impedence	**Ohm**	100			
Amplitude	**V**	2.2 +/- 0.2 Vpp			
Signal offset	**V**	2.5 +/- 1%			
THERMAL SENSOR PT1000					
Type		PT1000-R8/2-2F			
Resistence at 20° / Resistance at 100°	**Ohm**	1078 / 1385			
Precision	**°C**	+/- (0.3-0.005t)			

AIR COOLING

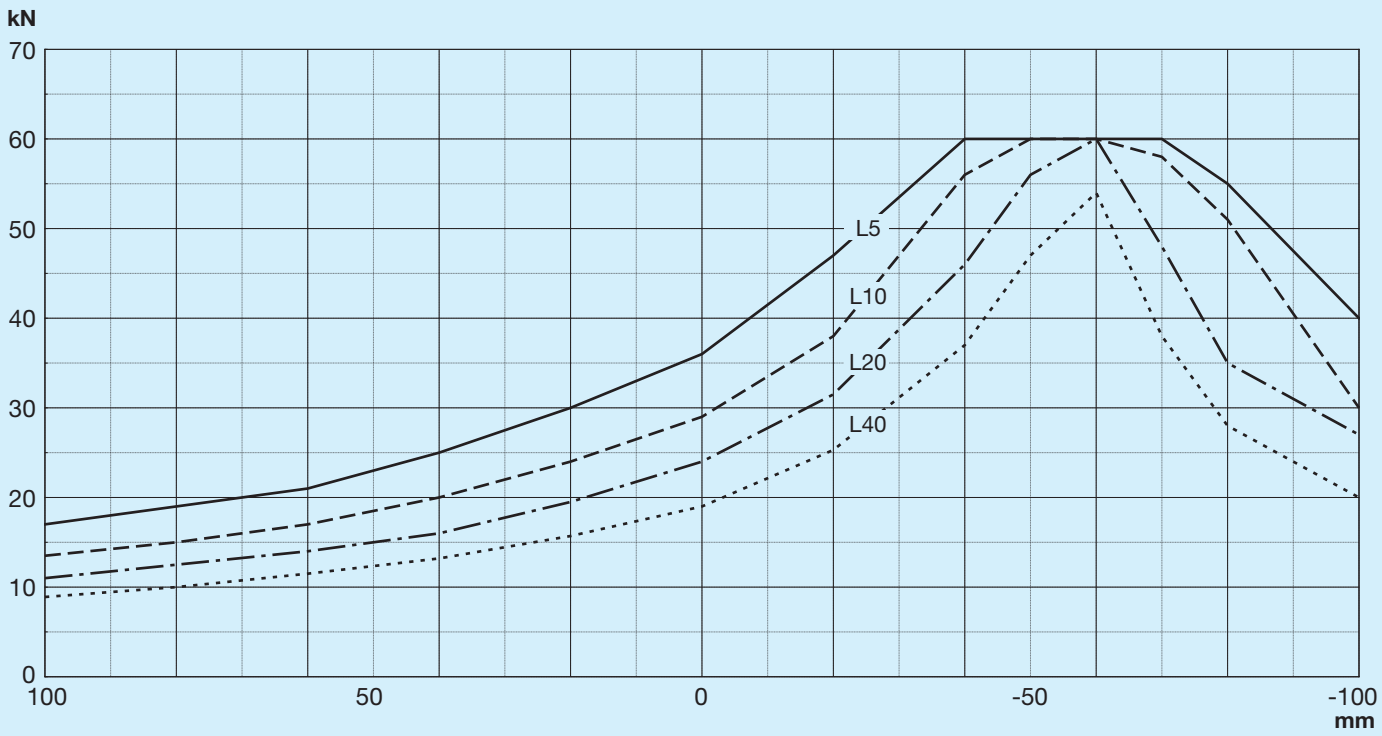


LIQUID COOLING

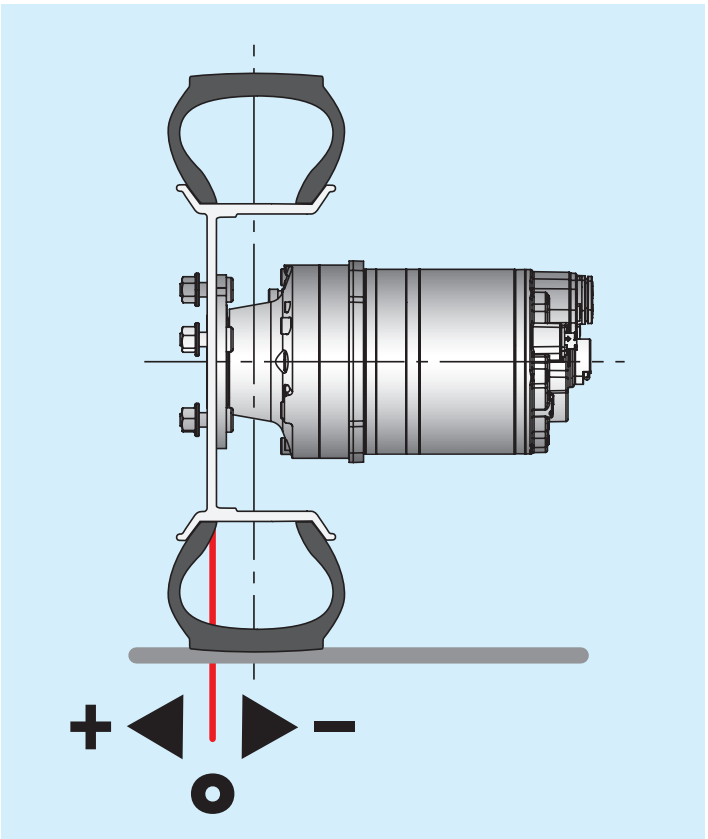


	L	
	mm	**inch**
MSM 050	223	8,8
MSM 075	248	9,8
MSM 100	273	10,7

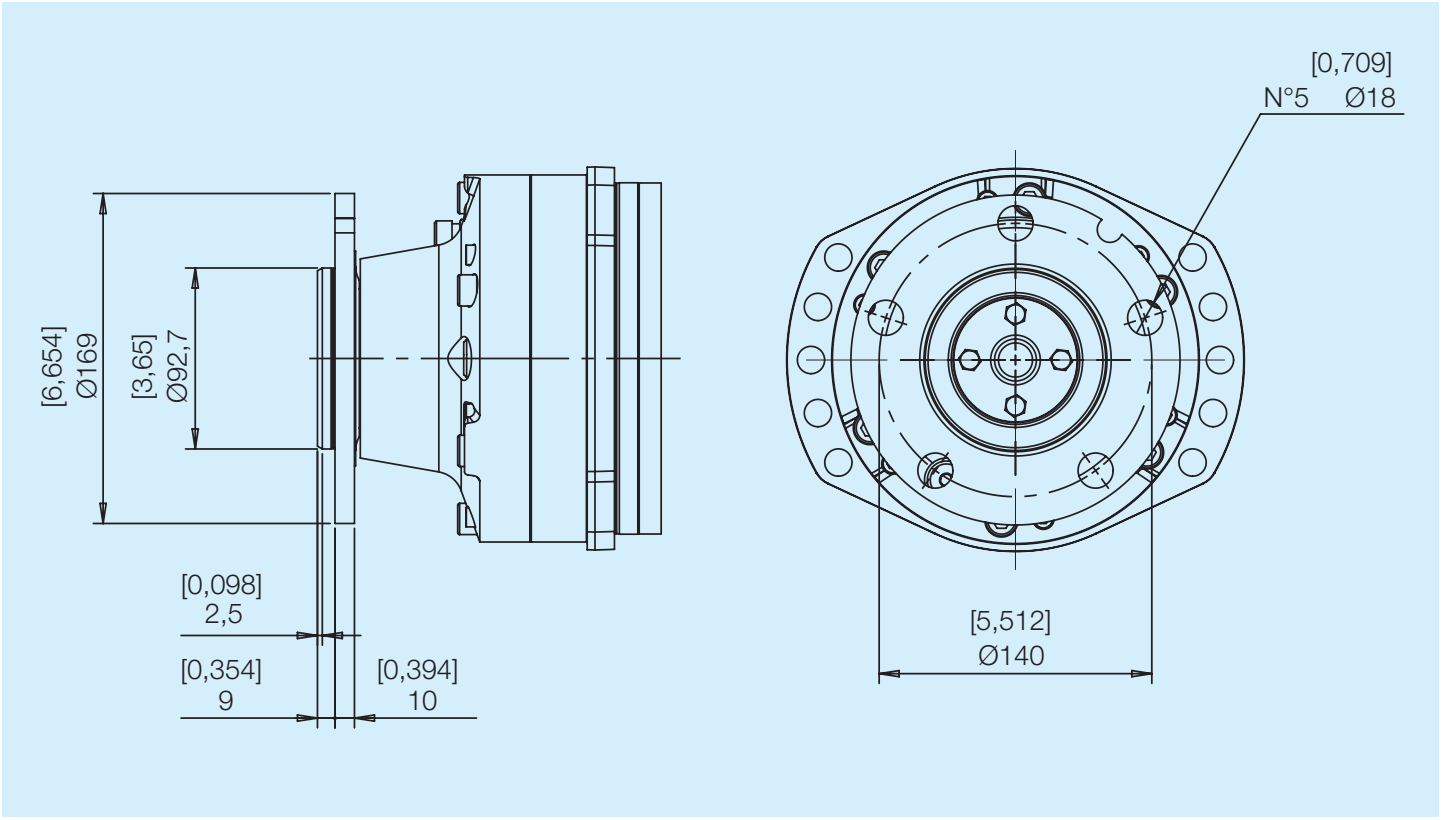
Radial load and service life of bearings



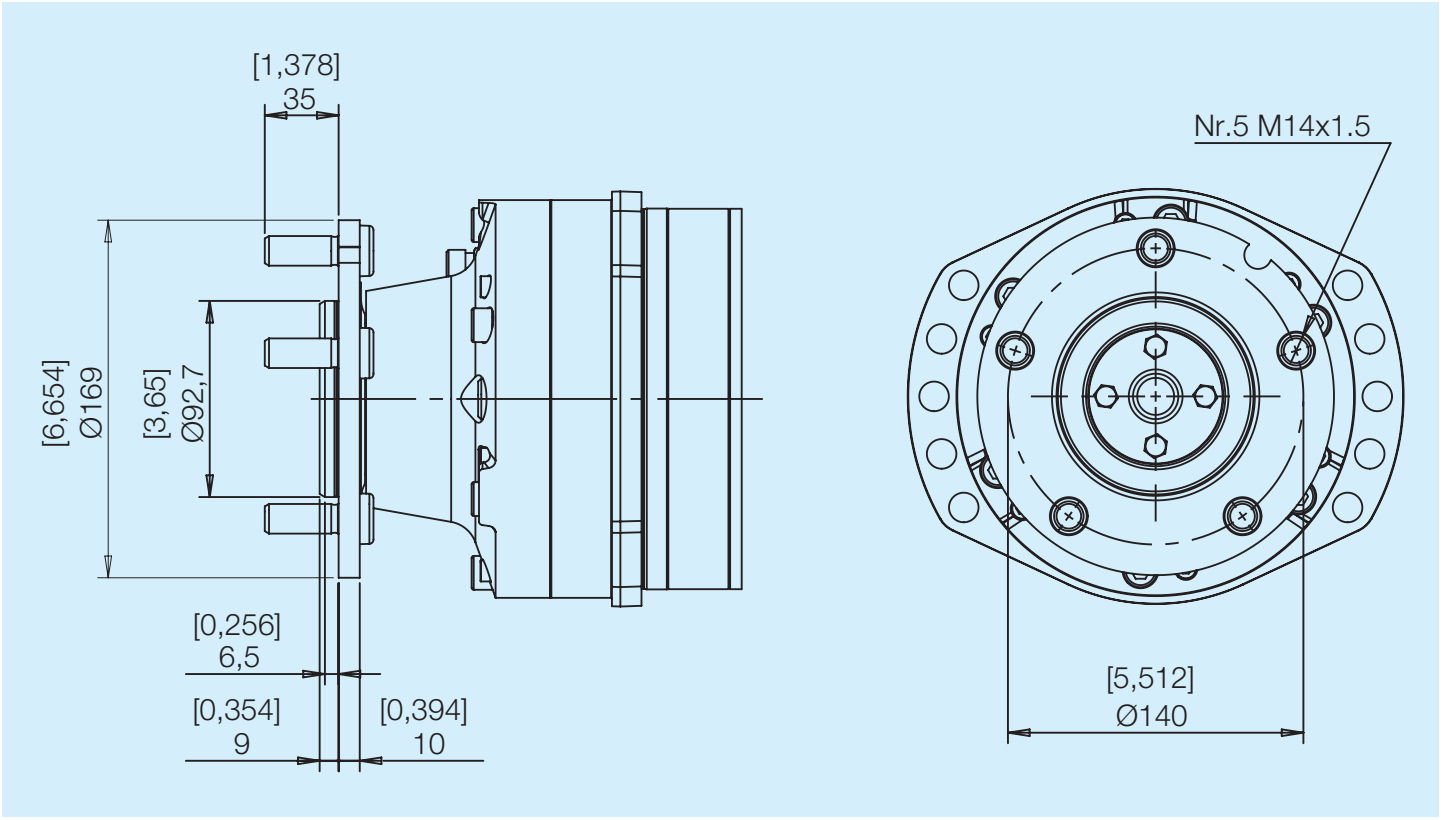
The curves of the permissible radial loads Fr, as a function of the abscissa x (distance from the wheel mounting surface), show the value corresponding to the service life L in millions of cycles of the bearings, calculated on the basis of ISO281.



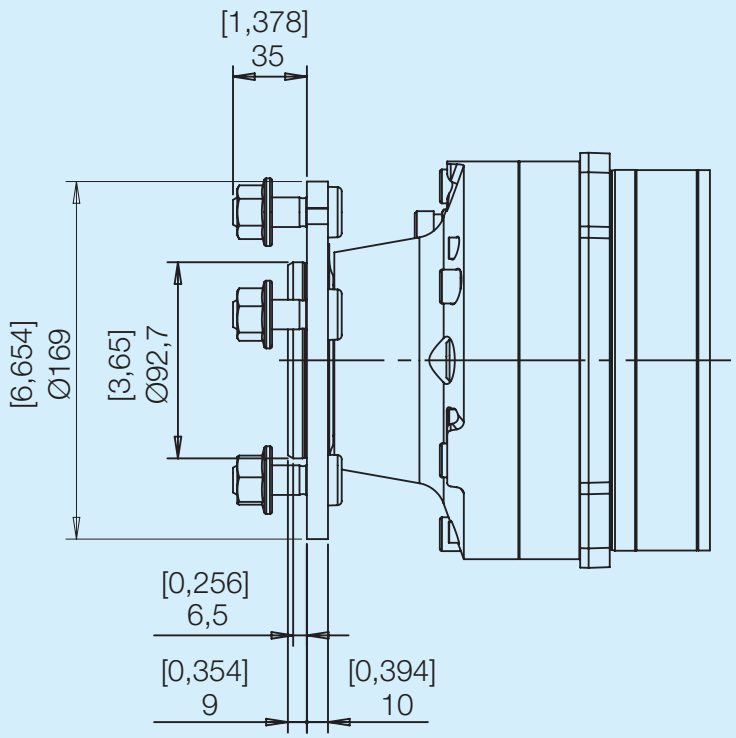
R Back (wheel)

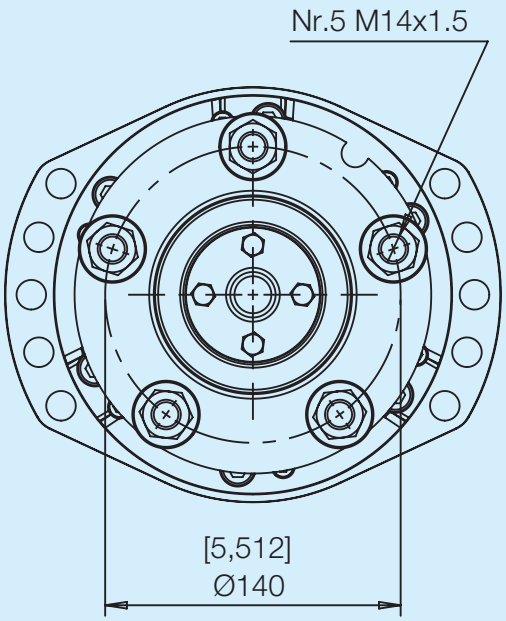


1 Back (wheel with studs)

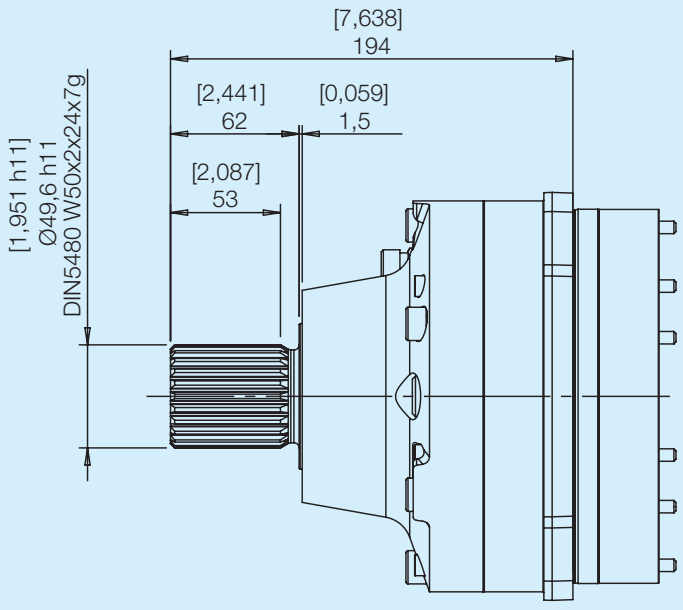


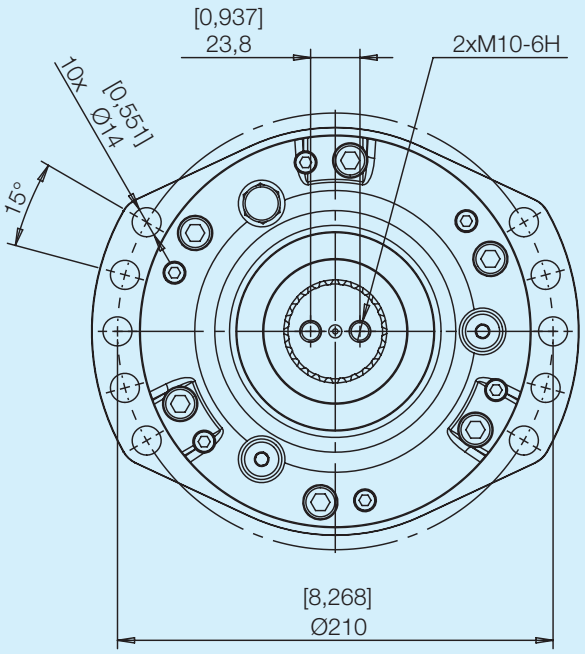
2 Back (wheel with studs+bolts)





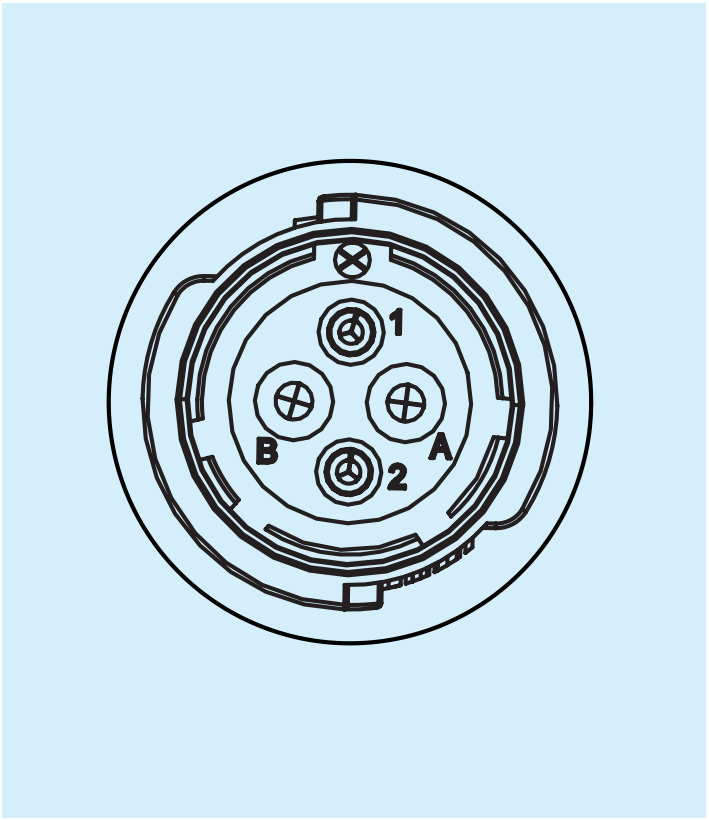
E Shaft DIN 5480 W50x2x30x24





Brake - connection - thermal sensor

T connector

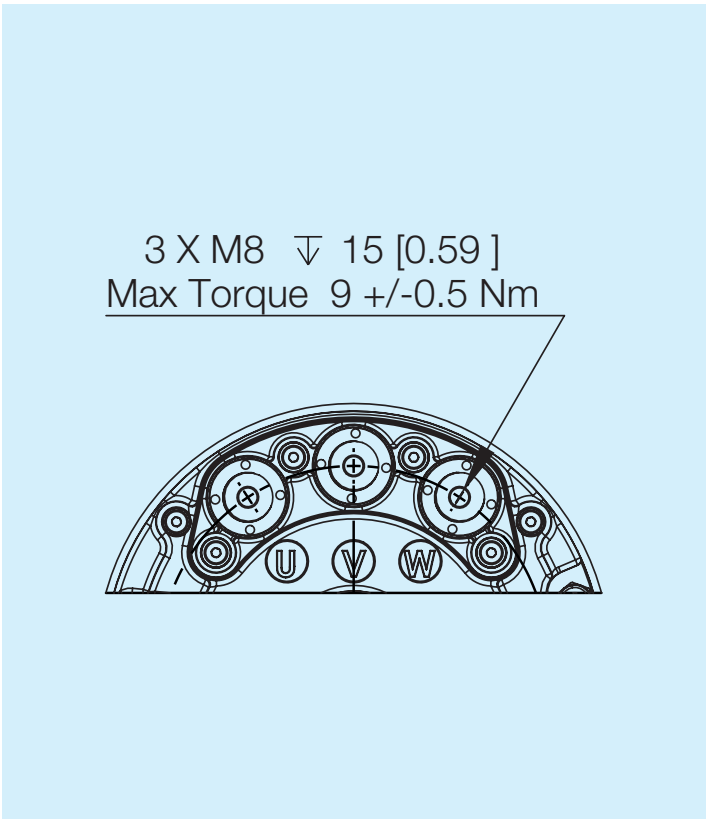


Pin	Signal
1	PT1000
3	
A	Brake V+
B	Brake V-

A

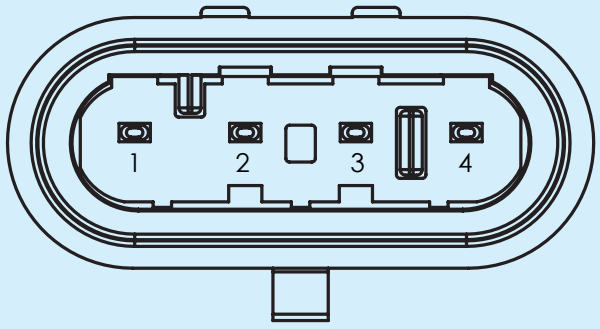
Mating kit for motors without brake MS5CON001R
Mating kit for motors with brake MS5CON002R

P connector



Signal pinout - disengagement

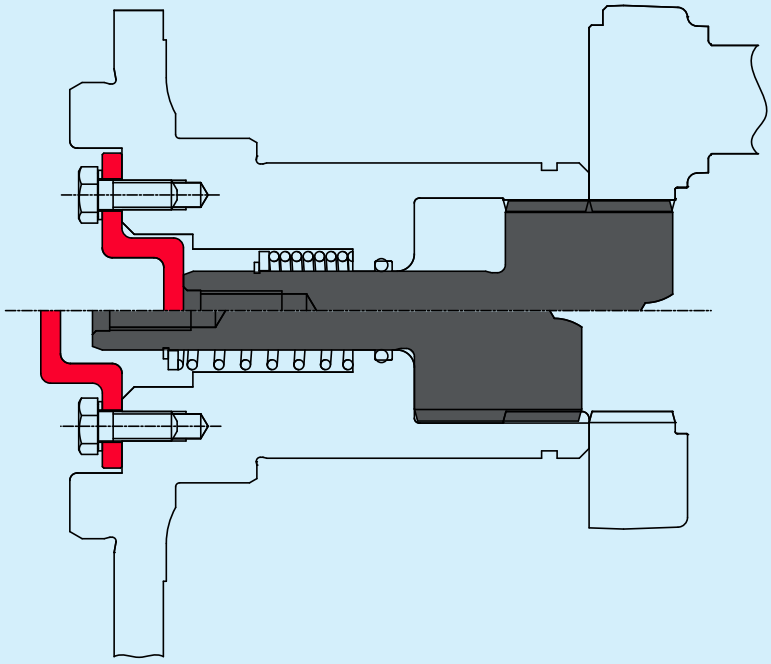
S connector



Pin	Signal
1	Vin+
2	COS out
3	SIN out
4	GND

Superseal 4 poles sin/cos encoder AMP 282106-1
Mating Female Plug Housing AMP 282088-1

Y Towing disengagement



Instructions for ordering

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MSM															

1 2

Motor dimension

18	

3

Motor/Cooling type

2	MSM 050 - air cooled	**3**	MSM 075 - air cooled	**4**	MSM 100 - air cooled	**7**	MSM 050 - liquid cooled
8	MSM 075 - liquid cooled	**9**	MSM 100 - liquid cooled				

4

Power configuration

A	48V	**B**	96V

5

Encoder

1	Sin/Cos

6

Cable outlet

A	Rear

7

Reduction ratio

A	1:31 (3 planet gears)	**B**	1:31 (4 planet gears)

8

Output connection

X	Rotary flange

9

Output Shaft

R	Back (wheel)	**1**	Back (wheel with studs)	**2**	Back (wheel with studs+bolts)	**E**	Shaft DIN 5480 W50x2x30x24

10

Parking brake

A	36Nm EM	**N**	No brake

11

Dynamic brake

N	No brake

12

Towing disengagement

Y	Yes (standard for wheel output shaft)	**N**	No (standard for DIN 5480 W50x2x30x24 output shaft)

13 14 15

Customization

001	No varnishing