

Motor Rated Power			2200W
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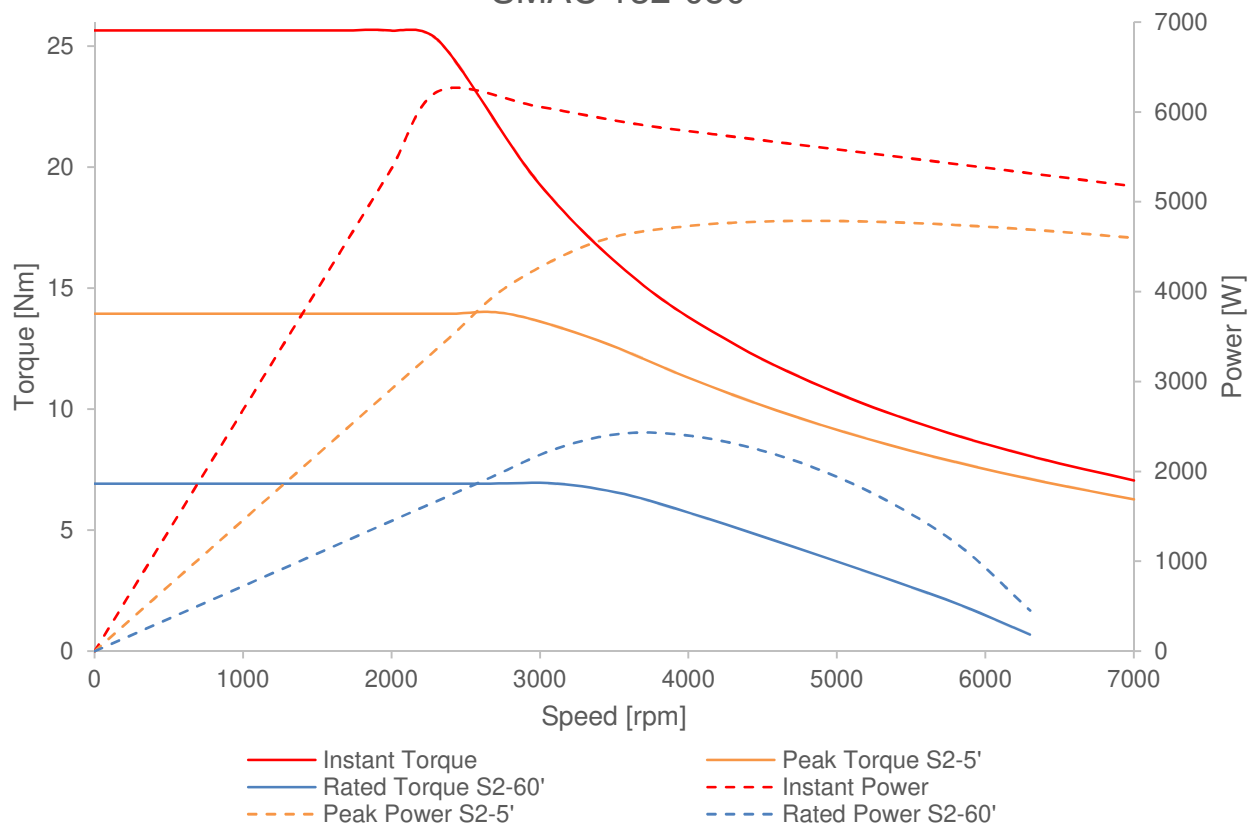
Inverter Power Supply			24Vdc
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Description	Symbol	Unit	
Duty	-	-	S2-60min
Nominal Speed	n_n	rpm	3000
Frequency (N° poles)	$f (2p)$	Hz	200.0 (8)
Costant Voltage	K_e	Vrms/Krpm	4.5
Costant Torque	K_t	Nm/Arms	0.07
Instant Torque	T_i	Nm	25.5
Instant Current	I_i	Arms	400.0
Peak Torque S2-5min.	T_p	Nm	14.0
Peak Current S2-5min.	I_p	Arms	190.0
Rated Torque S2-60min.	T_r	Nm	7.0
Rated Current S2-60min.	I_r	Arms	95.0
Rotor Inertia	J_r	kg x m ²	0.007
Ambient Temperature	θ_a	°C	-15 ÷ +40
Protection Degree	IP		IP 54 up to IP67
Insulation Class	-	-	F
Thermal protection	-	-	KTY 84-130
Cooling system			Air

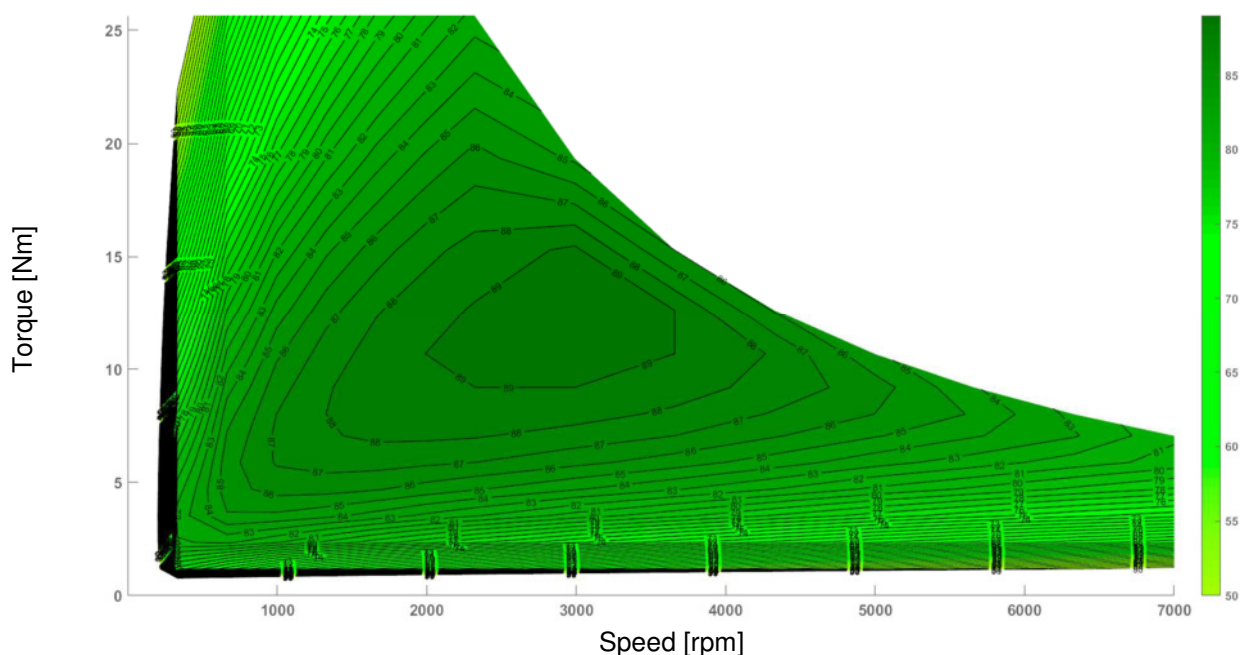
PRELIMINARY

Speed-Torque & Speed Power Motor Curves (*)

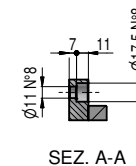
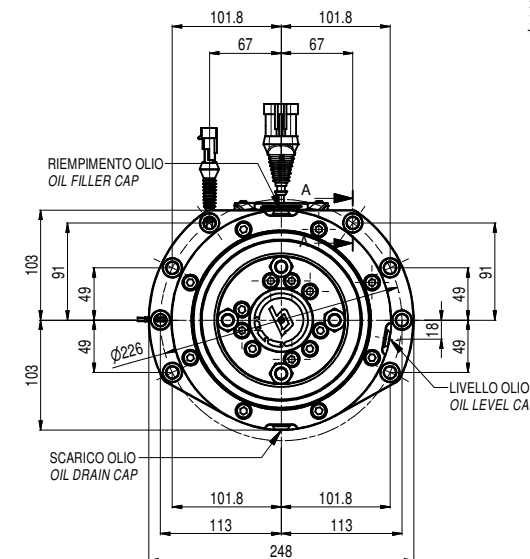
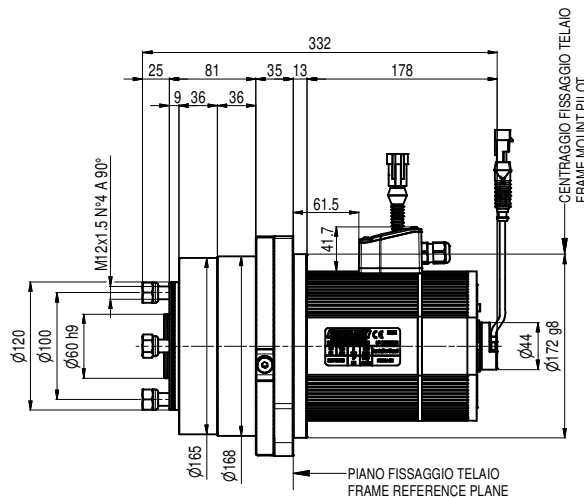
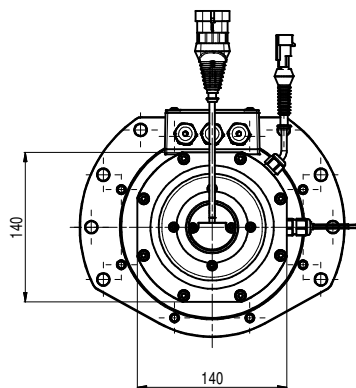
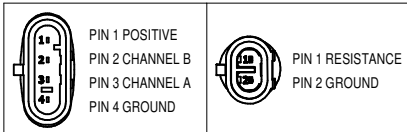
SMAC 132-050



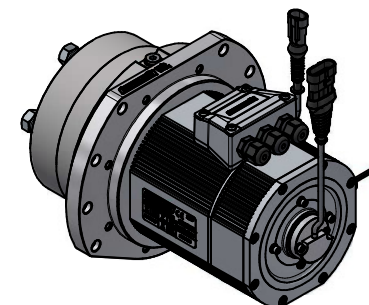
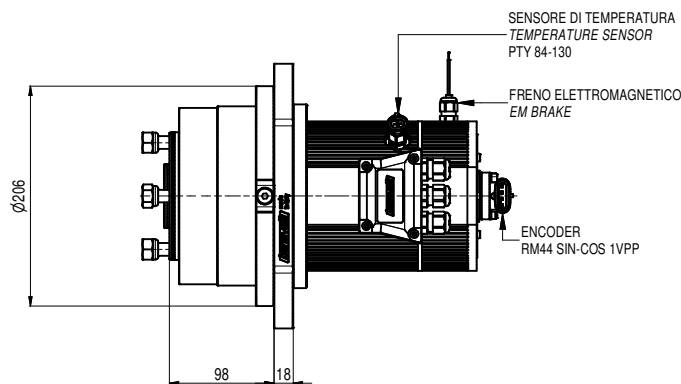
Efficiency Map % (*)



* MTPA Field Weakening strategy control & Optimized Advance Angle



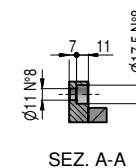
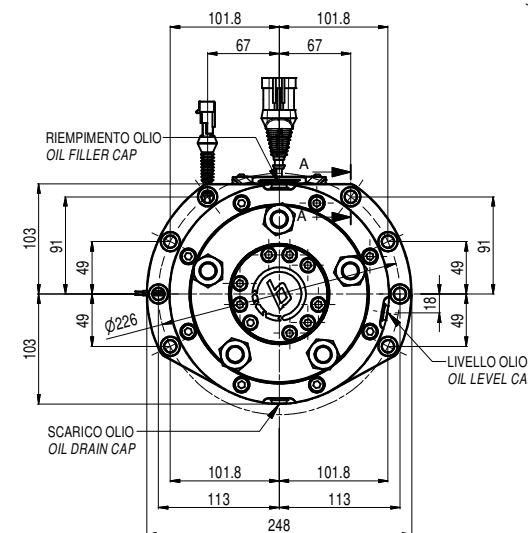
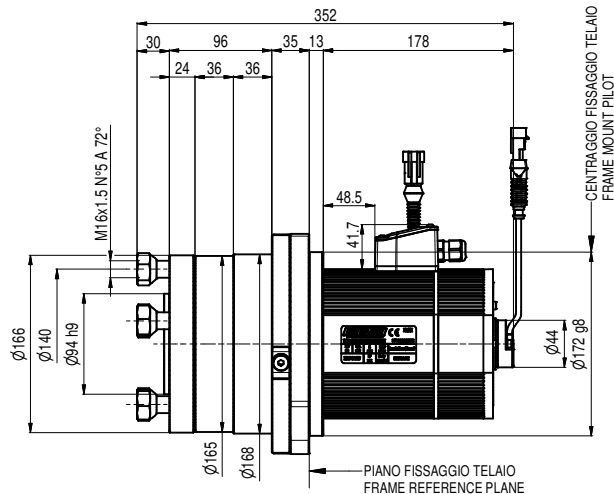
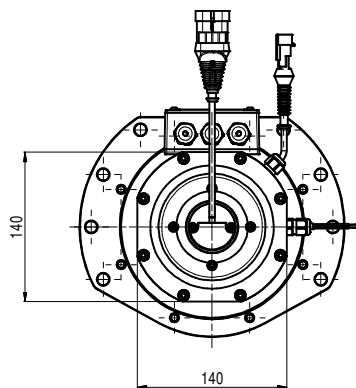
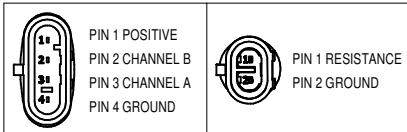
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MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	24
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	95
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 24
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



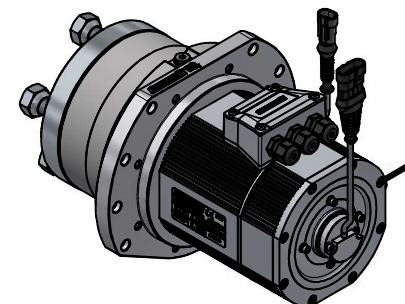
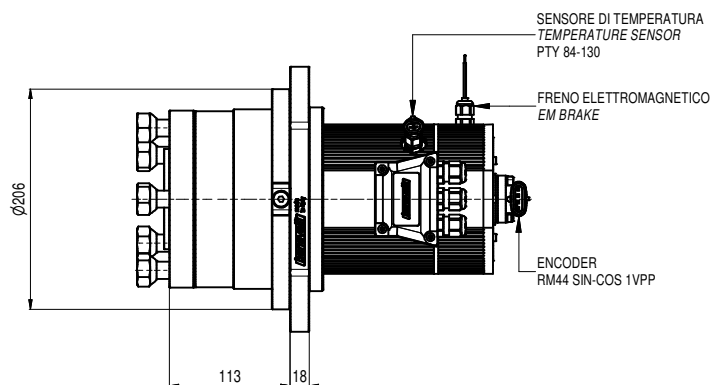
IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

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3				

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mc	01/09/2022			
controllato / checked	data / date			sottogruppo/subgroup
scala / scale	formato foglio / sheet size	descrizione / name	n° disegno/drawing no	
1:5	A3	Motoruota WD 220 / Wheel drive WD 220	99.220.041.A.3.43	
revisione / reference	n° foglio / sheet no			
00	1 / 3			



MDS		51J13205024CT080400	
MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	24
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	95
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 24
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

N°	Descrizione modifica	Data	Dis.	Pos.

disegnato / drawn mc	data / date 02/09/2022	INGOMBRO / DIMENSION		benevalli Rubiera-Reggio Emilia-Italy www.benevalli.it
controllato / checked	data / date			
scala / scale 1:5	formato foglio / sheet size A3	descrizione / name Motoruota WD 220 / Wheel drive WD 220	gruppo/group 99	sottogruppo/subgroup
revisione / reference 00	n° foglio / sheet no 1 / 3		n° disegno/drawing no 99.220.041.A.3.45	

Motor Rated Power			2200W
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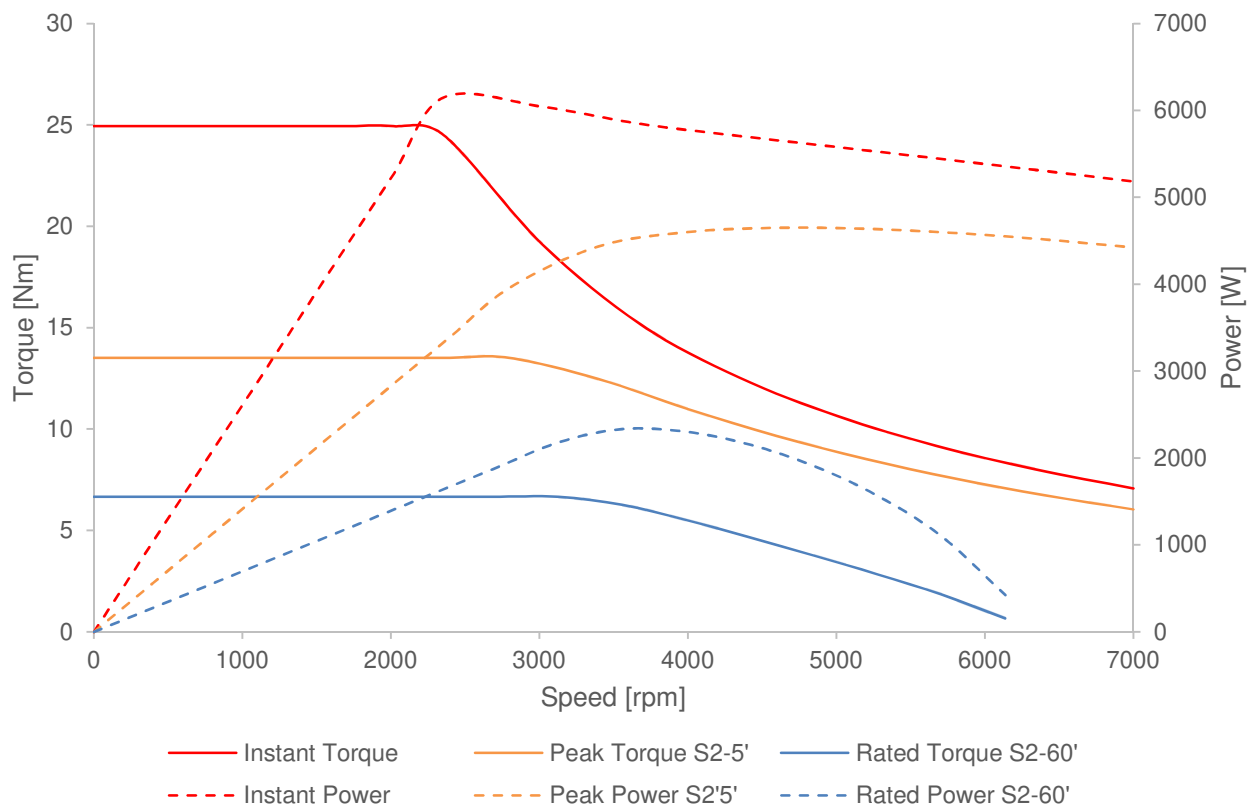
Inverter Power Supply			48Vdc
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Description	Symbol	Unit		
Duty	-	-	S2-60min	
Nominal Speed	n_n	rpm	3000	
Frequency (N° poles)	$f (2p)$	Hz	200.0 (8)	
Costant Voltage	K_e	Vrms/Krpm	9.4	
Costant Torque	K_t	Nm/Arms	0.15	
Instant Torque	T_i	Nm	25.5	
Instant Current	I_i	Arms	200.0	
Peak Torque S2-5min.	T_p	Nm	14.0	
Peak Current S2-5min.	I_p	Arms	93.0	
Rated Torque S2-60min.	T_r	Nm	7.0	
Rated Current S2-60min.	I_r	Arms	47.0	
Rotor Inertia	J_r	kg x m ²	0.007	
Ambient Temperature	θ_a	°C	-15 ÷ +40	
Protection Degree	IP		IP 54	up to IP67
Insulation Class	-	-	F	
Thermal protection	-	-	KTY 84-130	
Cooling system			Air	

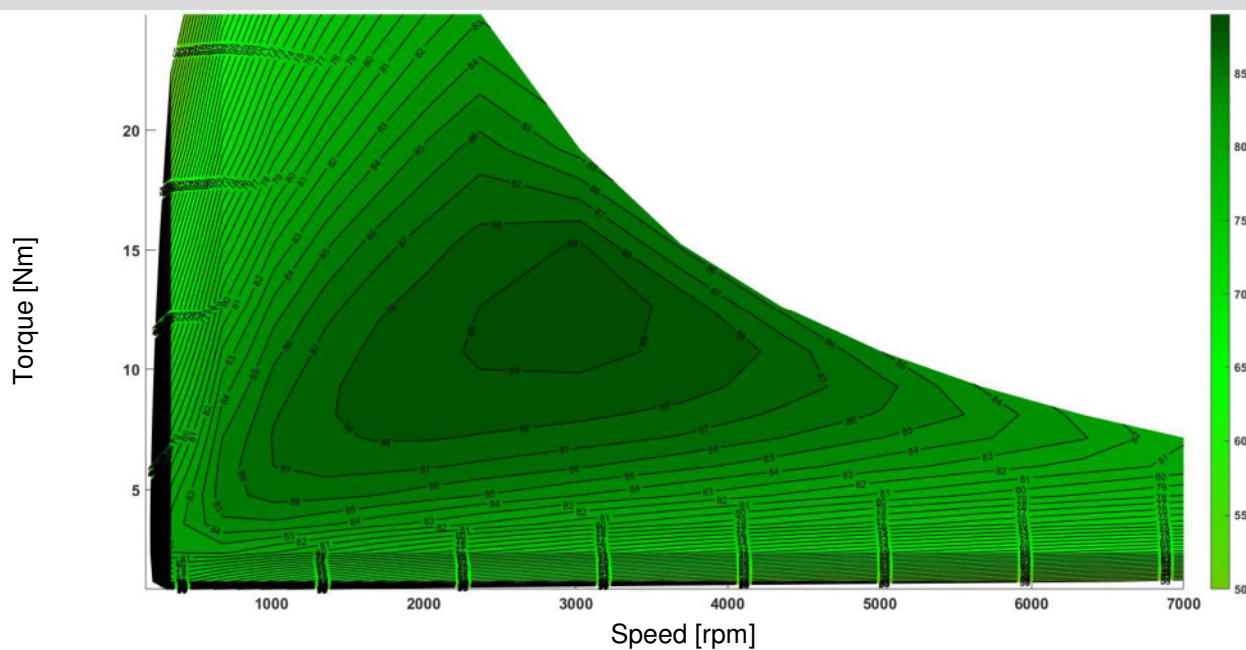
PRELIMINARY

Speed-Torque & Speed Power Motor Curves (*)

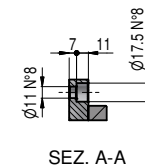
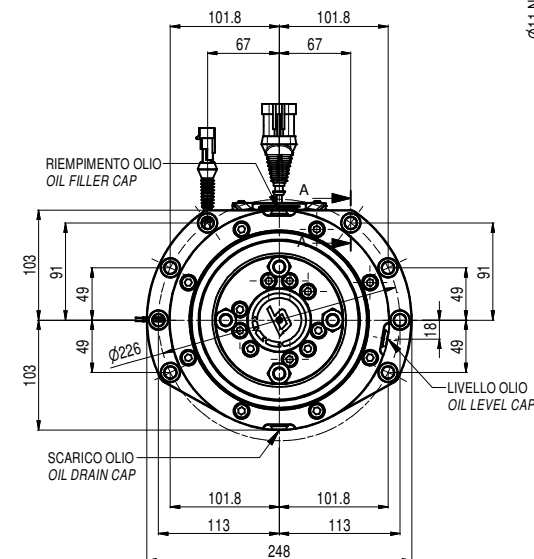
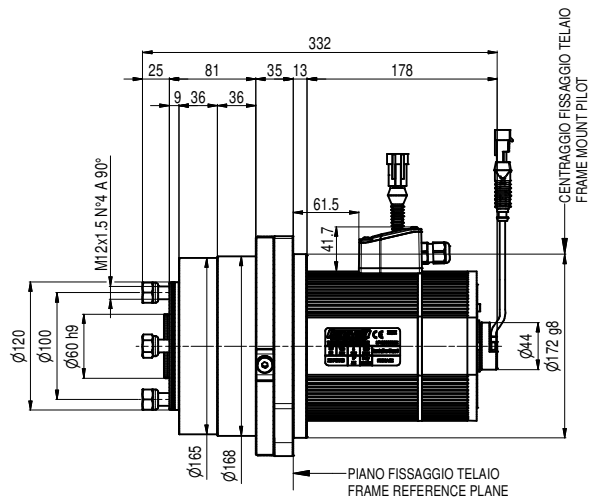
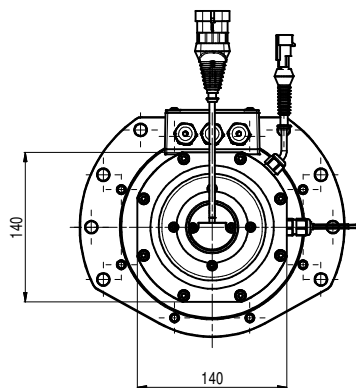
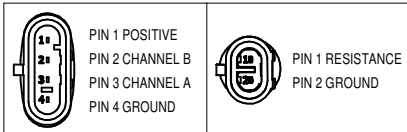
SMAC 132-050



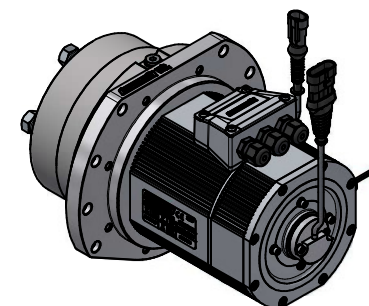
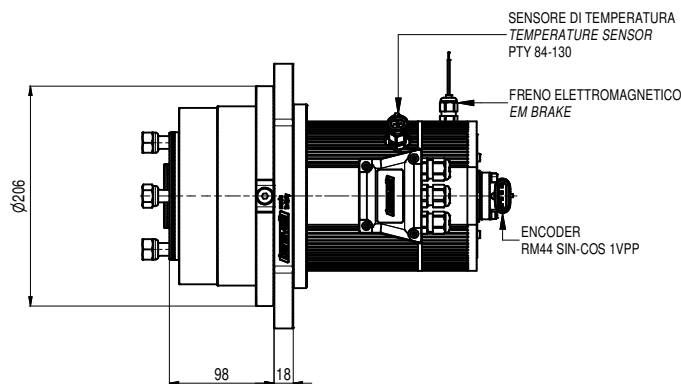
Efficiency Map % (*)



* MTPA & MTPV Field Weakening strategy control & Optimized Advance Angle



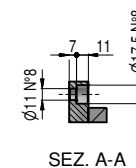
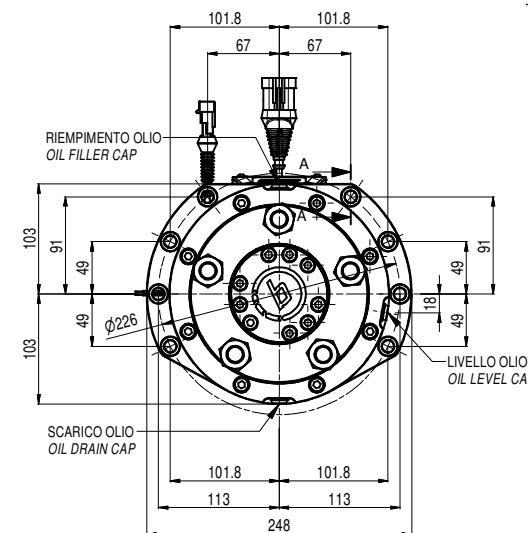
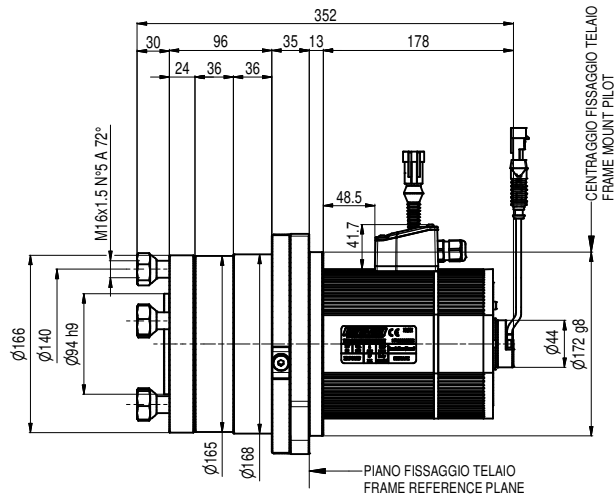
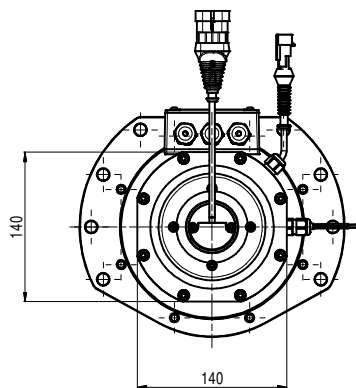
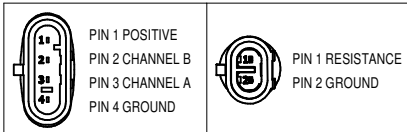
DATASHEET MOTORE	MOTOR DATASHEET	51J13205048ET080400	
MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	48
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	47
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 48
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



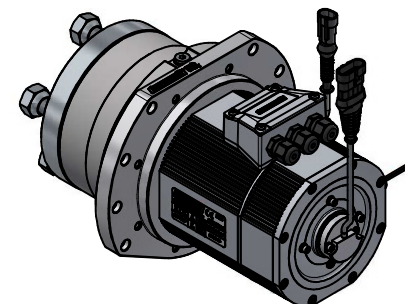
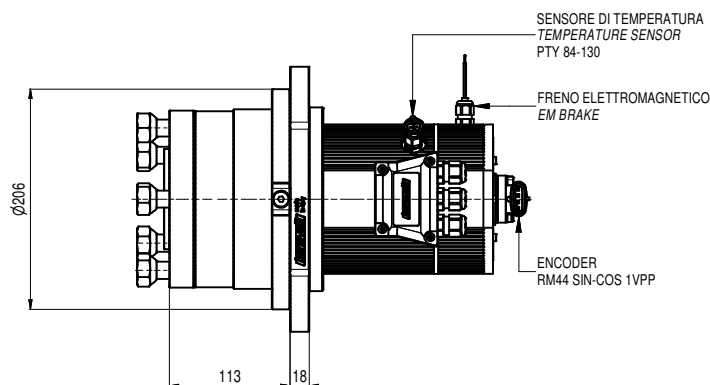
IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

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mc	10/06/2022			
controllato / checked	data / date			gruppo/group
				sottogruppo/subgroup
scala / scale	formato foglio / sheet size	descrizione / name		99
1:8	A3	Motoruota WD 220 / Wheel drive WD 220		n° disegno/drawing no
revisione / reference	n° foglio / sheet no			99.220.041.A.3.31
00	1 / 3			



MDS		51J13205048ET080400	
MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	48
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	4.7
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 48
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

N°	Descrizione modifica	Data	Dis.	Pos.
1				
2				
3				

disegnato / drawn mc	data / date 27/07/2022	INGOMBRO / DIMENSION		benevelli Rubiera-Reggio Emilia-Italy www.benevelli.it
controllato / checked	data / date			
scala / scale 1:5	formato foglio / sheet size A3	descrizione / name Motoruota WD 220 / Wheel drive WD 220	gruppo/group 99	sottogruppo/subgroup
revisione / reference 00	n° foglio / sheet no 1 / 3		n° disegno/drawing no 99.220.041.A.3.39	



ELECTRIC POWERTRAIN SOLUTIONS

SMAC SERIE
TECHNICAL DATA SHEET
3-PHASE SYNCHRONOUS MOTOR

Code	51J13205080GT080400		
Rev.	00		
Date	25/03/2021		
Page	1	di	2

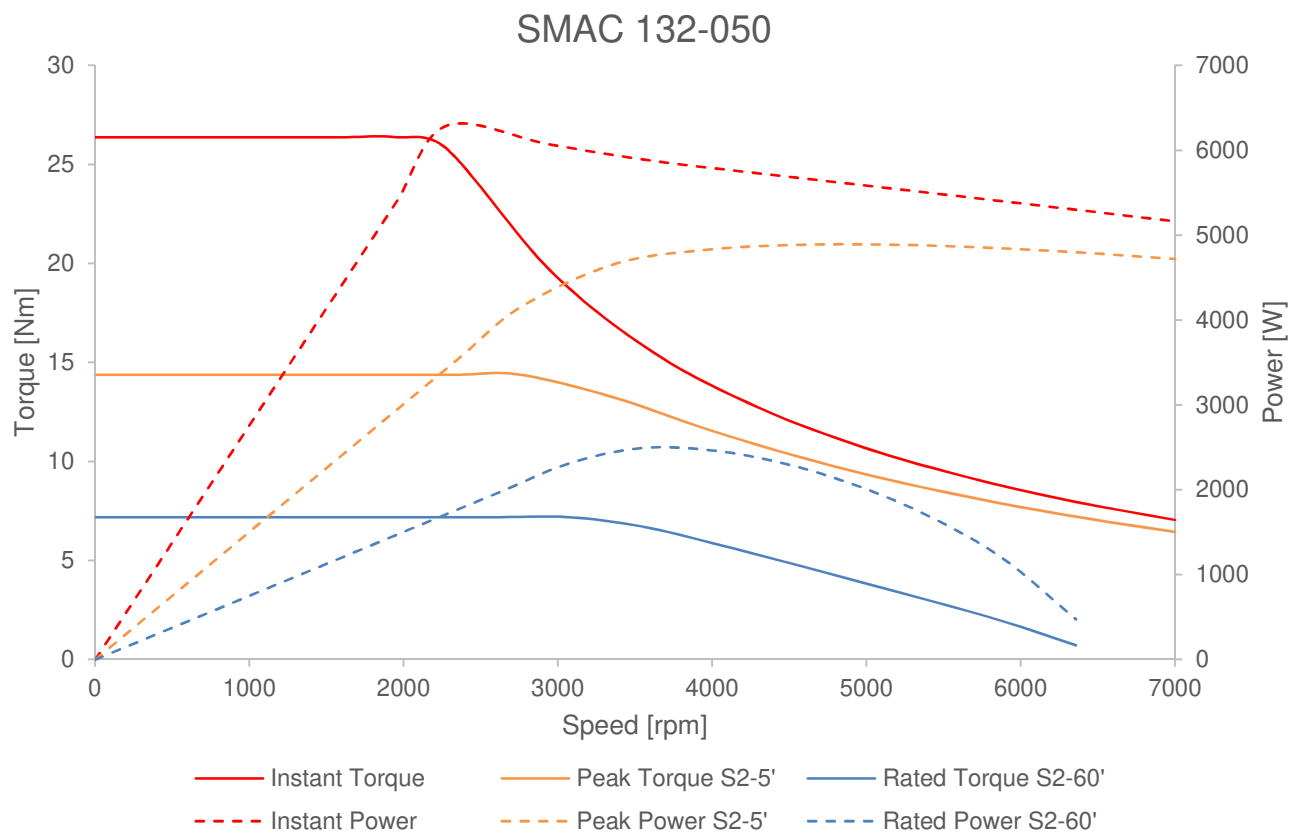
Motor Rated Power			2200W
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Inverter Power Supply			80Vdc
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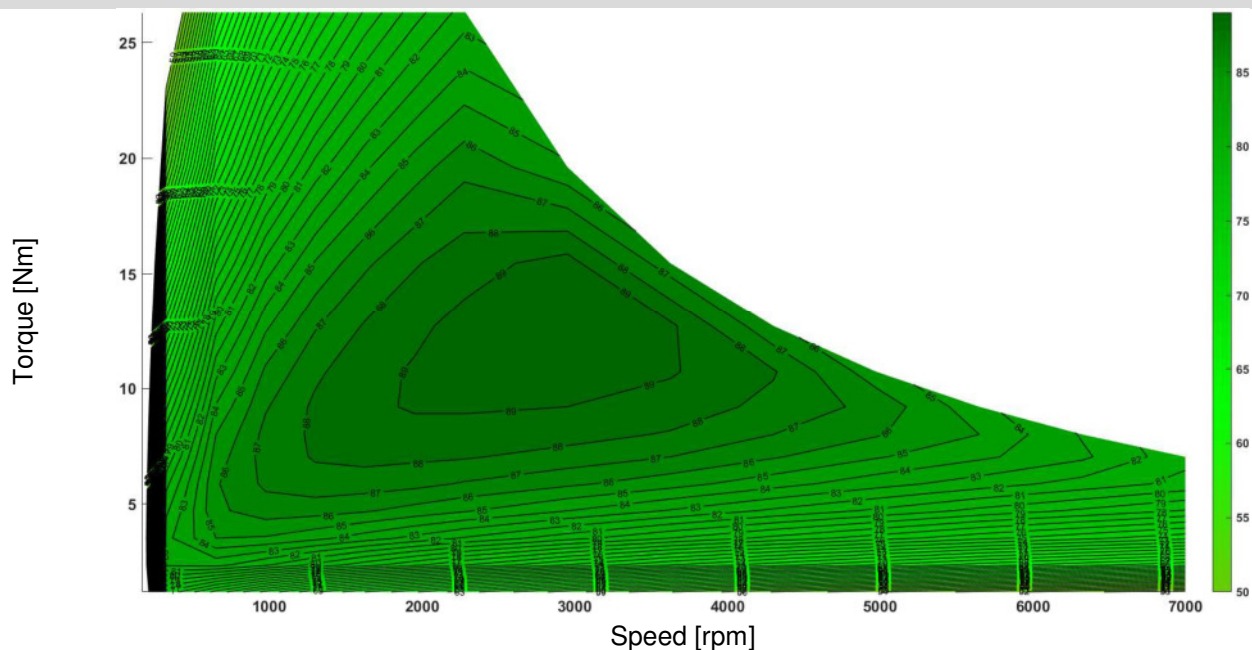
Description	Symbol	Unit		
Duty	-	-	S2-60min	
Nominal Speed	n_n	rpm	3000	
Frequency (N° poles)	$f (2p)$	Hz	200.0 (8)	
Costant Voltage	K_e	Vrms/Krpm	15.5	
Costant Torque	K_t	Nm/Arms	0.25	
Instant Torque	T_i	Nm	25.5	
Instant Current	I_i	Arms	130.0	
Peak Torque S2-5min.	T_p	Nm	14.0	
Peak Current S2-5min.	I_p	Arms	60.0	
Rated Torque S2-60min.	T_r	Nm	7.0	
Rated Current S2-60min.	I_r	Arms	30.0	
Rotor Inertia	J_r	kg x m ²	0.007	
Ambient Temperature	θ_a	°C	-15 ÷ +40	
Protection Degree	IP		IP 54	up to IP67
Insulation Class	-	-	F	
Thermal protection	-	-	KTY 84-130	
Cooling system			Air	

PRELIMINARY

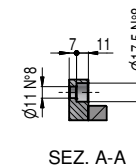
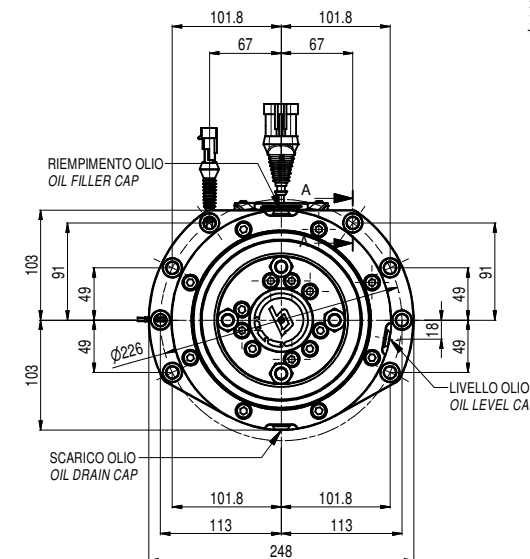
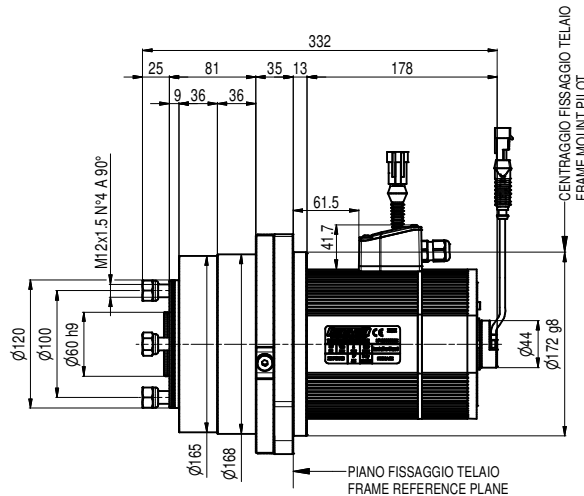
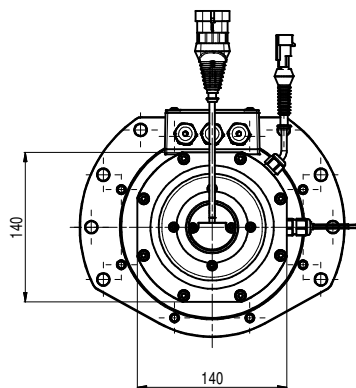
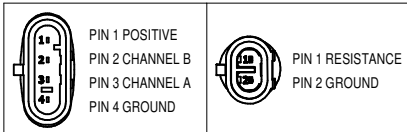
Speed-Torque & Speed Power Motor Curves (*)



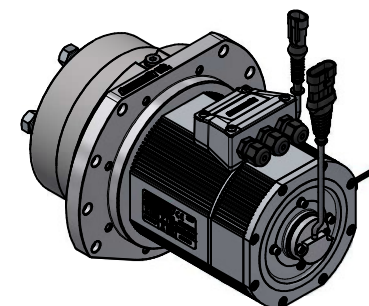
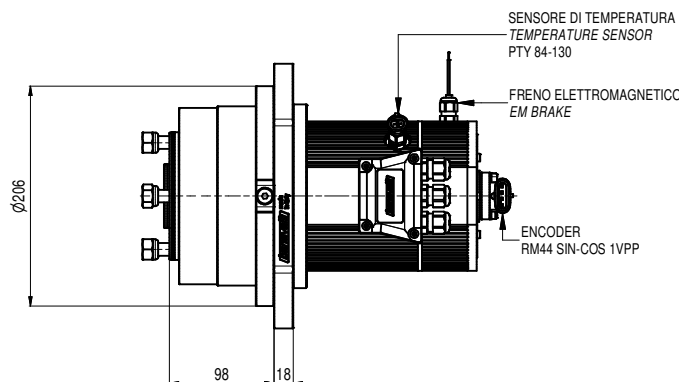
Efficiency Map % (*)



* MTPA & MTPV Field Weakening strategy control & Optimized Advance Angle



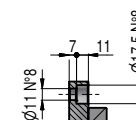
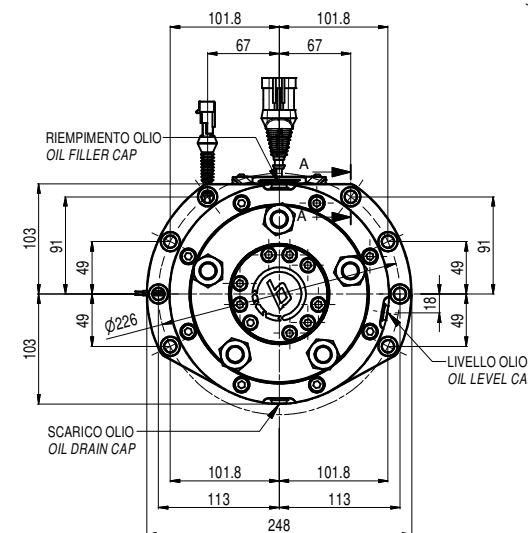
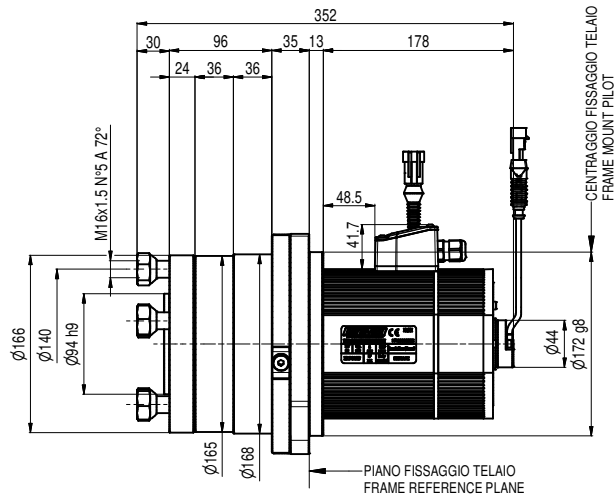
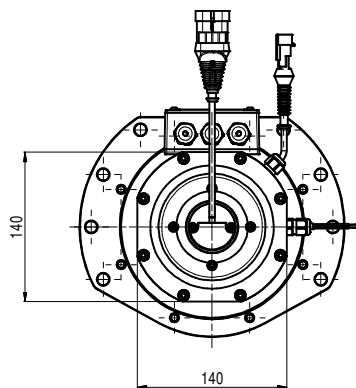
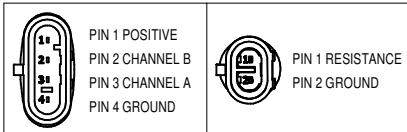
DATASHEET MOTORE	MOTOR DATASHEET	51J13205080GT080400	
MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	80
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	30
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 48
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

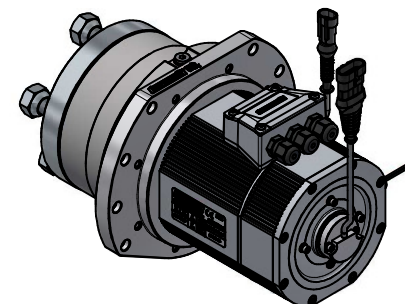
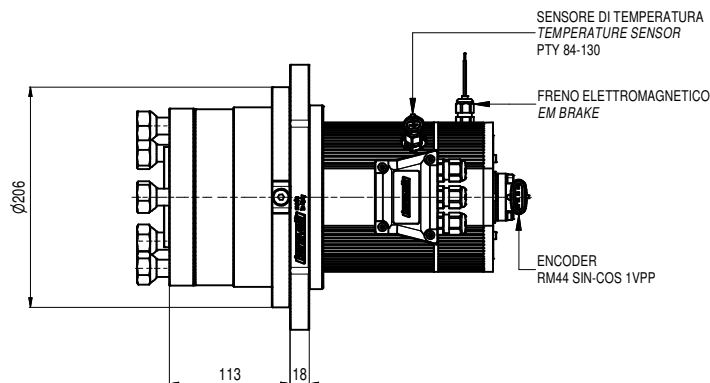
N°	Descrizione modifica	Data	Dis.	Pos.

disegnato / drawn mc	data / date 06/09/2022	INGOMBRO / DIMENSION		benevalli Rubiera-Reggio Emilia-Italy www.benevalli.it
controllato / checked	data / date			
scala / scale 1:5	formato foglio / sheet size A3	descrizione / name Motoruota WD 220 / Wheel drive WD 220	gruppo/group 99	sottogruppo/subgroup
revisione / reference 00	n° foglio / sheet no 1 / 3		n° disegno/drawing no 99.220.041.A.3.48	



SEZ. A-A

MDS		51J13205080GT080400	
MOTORE	MOTOR		SMAC
POTENZA	POWER	W	2200
TENSIONE BATTERIA	BATTERY VOLTAGE	Vdc	80
TENSIONE FASE	VOLTAGE ON PHASE	Vac	-
GIRI NOMINALI	RATED SPEED	rpm	3000
GIRI MASSIMI	MAX SPEED	rpm	-
COPPIA MAX	MAX TORQUE	Nm	25.5
CORRENTE NOMINALE	RATED CURRENT	A	30
FREQUENZA NOMINALE	RATED FREQUENCY	Hz	200 (8)
SERVIZIO	DUTY	S2	60'
PROTEZIONE	PROTECTION	IP	67
CLASSE ISOLAMENTO	INSULATION CLASS	INS	F
IMPULSI ENCODER	PULSES REVOLUTION	N°	-
FRENO EM	EM BRAKE	Nm - V	12 - 48
FRENO SERVIZIO IDRA.	IDRA. SERVICE BRAKE	Nm	-
FRENO STAZIONAMENTO	PARKING BRAKE	Nm	-
RAPPORTO	RATIO	R	1:40.61
GIRI NOMINALI IN USCITA	NOM. OUTPUT SPEED	rpm	74
GIRI MASSIMI IN USCITA	MAX OUTPUT SPEED	rpm	-
COPPIA MAX IN USCITA	MAX OUTPUT TORQUE	Nm	1000
QUANTITA' OLIO	OIL CAPACITY	cc	180
INSERIRE OLIO	OIL INSIDE		Si/Yes
TIPO OLIO	OIL TYPE		SHC 75W90
PESO	WEIGHT	kg	



IN CASO DI DUBBIO CHIEDERE / IF IN DOUBT ASK

N°	Descrizione modifica	Data	Dis.	Pos.
1				
2				
3				

disegnato / drawn mc	data / date 06/09/2022	INGOMBRO / DIMENSION		benevelli Rubiera-Reggio Emilia-Italy www.benevelli.it
controllato / checked	data / date			
scala / scale 1:5	formato foglio / sheet size A3	descrizione / name Motoruota WD 220 / Wheel drive WD 220	gruppo/group 99	sottogruppo/subgroup
revisione / reference 00	n° foglio / sheet no 1 / 3		n° disegno/drawing no 99.220.041.A.3.51	