

# SUBMERSIBLE MOTORS

**12 INCH MTSF**

PRODUCT INFORMATION & SERVICE MANUAL



**SHAKTI**

**THE POWER OF INNOVATION, EFFICIENCY & TECHNOLOGY.**

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## PRODUCT APPLICATION AND PRODUCT SPECIFICATION

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### GENERAL DATA

These 300 mm Rewindable motors, manufactured in ISO 9001:2015 certified facilities

#### Applications

This motor is built for dependable operation in 300 mm diameter or larger water wells. It is fitted with water lubricated radial and thrust bearings for a maintenance – free operations. The motor is filled with a special fluid, Providing frost protection down to -15°C storage temperature . A special diaphragm ensures pressure compensation inside the motor.

#### Product advantages

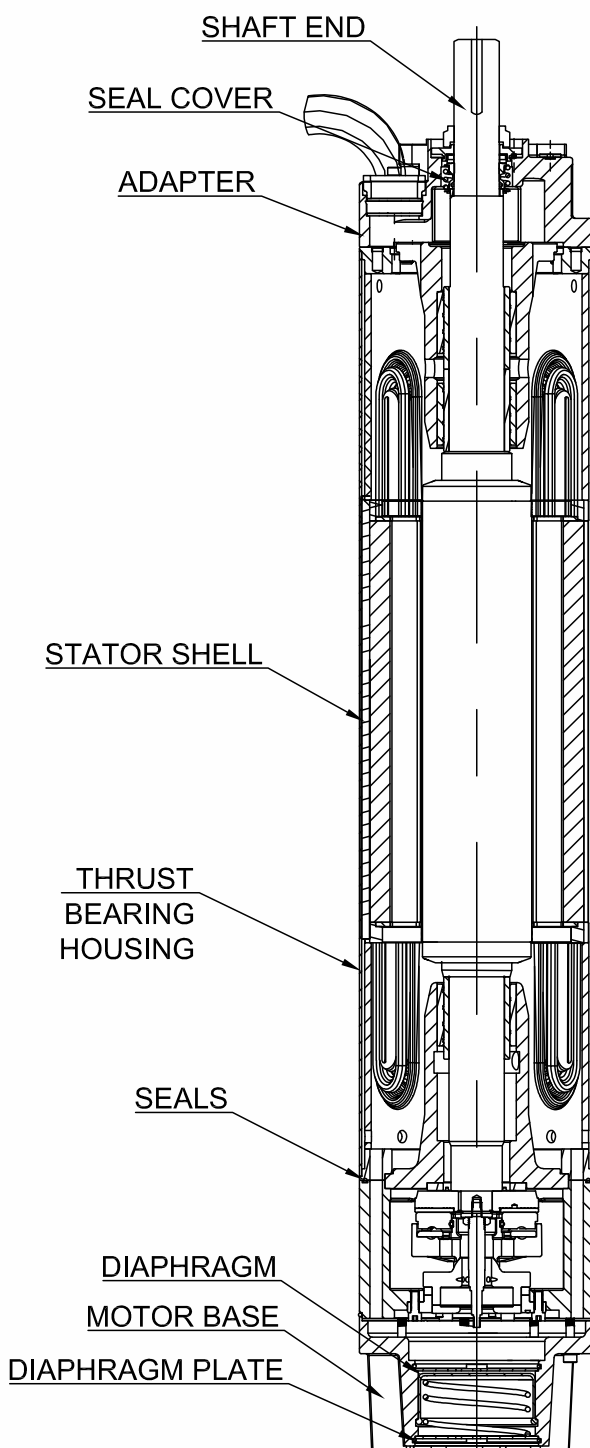
- High efficiency electrical design (low operation cost, cooler winding temperature).
- Design for retrofittable PT100 sensor.
- Motor With SiC Mechanical seal and sand slinger.
- Cable material in accordance with regulations for drinking water.
- Water lubricated radial and thrust bearing.
- All motors pre-filled and 100% tested.
- Non contaminating, water-filled design.
- Max. storage temperature -15°C to +60°C.

#### Technical specification

Power range	: 185 kW - 400 kW
Flange	: 300 mm
Degree of protection	: IP68
Ambient temperature	: 30°C
Cooling flow	: 0.5 m/s
Starts/hr	: 5 max
Voltage tolerance	: +6% / -10% U <sub>N</sub>

SUBMERSIBLE MOTOR			
Material	CI, Stainless Steel 304/316	Rating	185 kW - 400 kW
Type	Rewindable	Thrust Rating	60000 N

## MATERIAL OF CONSTRUCTION



PART	MATERIAL		
	CI	AISI SS 304	AISI SS 316
ADAPTER	CAST IRON POWER COATED	AISI SS 304	AISI SS 316
STATOR SHELL	AISI SS 304	AISI SS 304	AISI SS 316
SEALS	NBR	NBR	NBR
SEAL COVER	AISI SS 304	AISI SS 304	AISI SS 316
SHAFT SEAL	SIC	SIC	SIC
MOTOR BASE	CAST IRON POWER COATED	AISI SS 304	AISI SS 316
THRUST HOUSING	CAST IRON POWER COATED	AISI SS 304	AISI SS 316
DIAPHRAGM	EPDM	EPDM	EPDM
DIAPHRAGM COVER	AISI SS 304	AISI SS 304	AISI SS 316
LEAD	EPR	EPR	EPR

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### 12" Rewindable Motors Performance Data 50 Hz

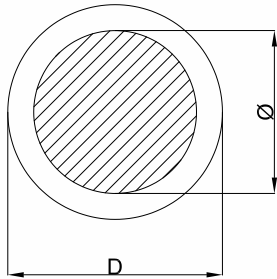
KW	Thrust	Voltage	Speed	I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	Efficiency at % Load			Power Factor at % Load			T <sub>N</sub>	T <sub>A</sub> /T <sub>N</sub>
						50	75	100	50	75	100		
185	60000	380	2910	363	4.60	84	85	87	0.85	0.87	0.89	607	0.85
		400	2915	353	5.30	85	86	87	0.82	0.85	0.87	606	0.90
		415	2920	340	5.70	86	87	88	0.81	0.84	0.86	605	0.93
220	60000	380	2939	439	5.03	87	87	88	0.80	0.84	0.86	715	0.75
		400	2944	421	5.04	88	88	89	0.79	0.81	0.85	712	0.83
		415	2949	410	5.05	88	88	89	0.78	0.82	0.84	710	0.94
250	60000	380	2913	504	4.55	87	88	87	0.81	0.84	0.87	820	0.86
		400	2918	482	4.56	88	87	88	0.80	0.82	0.85	818	0.97
		415	2923	471	4.57	87	87	88	0.79	0.82	0.84	816	1.03
300	60000	380	2932	591	4.66	87	88	89	0.80	0.83	0.87	977	0.83
		400	2937	566	4.67	88	88	89	0.81	0.85	0.86	975	0.92
		415	2942	552	4.68	87	87	89	0.78	0.82	0.85	972	1.01
350	60000	380	2931	692	4.56	88	87	88	0.81	0.88	0.87	1141	0.82
		400	2937	671	4.57	88	88	89	0.82	0.86	0.85	1139	0.93
		415	2941	653	4.57	87	88	89	0.81	0.82	0.84	1137	0.94
400	60000	380	2925	776	4.24	89	90	90	0.80	0.85	0.87	1306	0.75
		400	2930	737	4.25	89	90	90	0.82	0.86	0.87	1305	0.86
		415	2935	711	4.25	90	90	90	0.82	0.84	0.87	1303	0.94

### 12" Rewindable Motors Performance Data 60 Hz

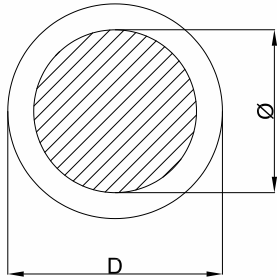
KW	P <sub>max</sub> (KW)	Thrust	Voltage	Speed	I <sub>N</sub>	I <sub>A</sub> /I <sub>N</sub>	Efficiency at % Load			Power Factor at % Load			T <sub>N</sub>	T <sub>A</sub> /T <sub>N</sub>
							50	75	100	50	75	100		
185	212	60000	460	3220	339	-	88	88	89	0.85	0.86	0.88	-	-
220	252	60000	460	3535	400	5.30	89	90	91	0.82	0.84	0.87	682	0.92
250	287	60000	460	3530	460	5.30	89	90	91	0.81	0.83	0.86	776	0.92
300	345	60000	460	3530	541	5.60	90	90	91	0.84	0.88	0.88	933	0.95
350	402	60000	460	3535	637	5.40	89	90	90	0.84	0.86	0.88	1085	0.95
400	460	60000	460	3525	737	4.90	89	89	90	0.83	0.86	0.87	1246	0.88

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### 12" REWINDABLE MOTOR LEADS @ 380 – 415 50 Hz & 160/ 60 Hz

LEAD	$\emptyset$ [mm <sup>2</sup> ]	D [mm]	L [m]	QYT	380 – 415V / 50 HZ 460 V / 60 HZ
	1X70	35	6	DOL 1 YΔ 2	185 – 300 DOL 350 – 400 YΔ
	1X35	17		DOL 1 YΔ 2	185 – 300 YΔ

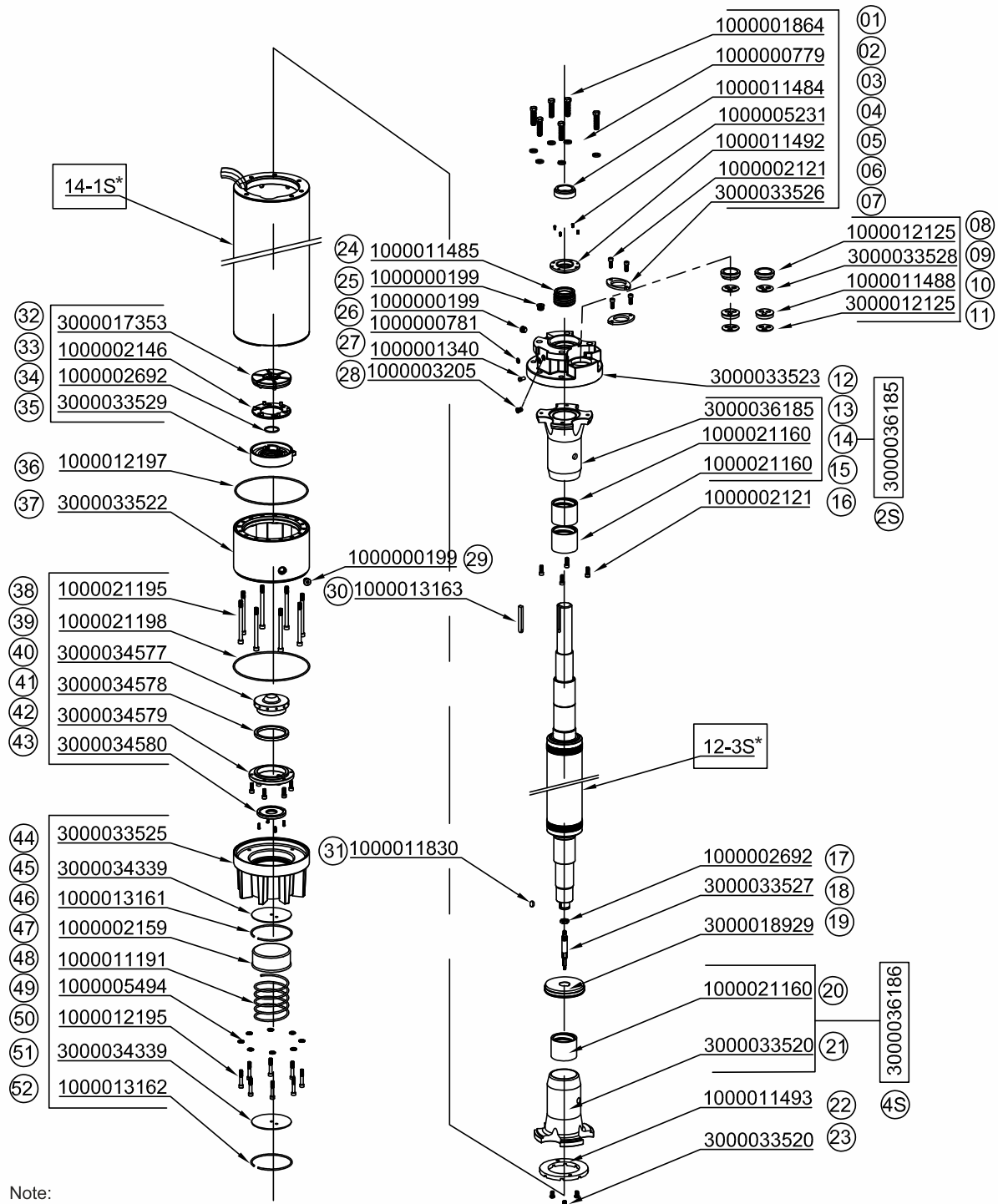
### GROUND LEAD

LEAD	$\emptyset$ [mm <sup>2</sup> ]	D [mm]	L [m]	QYT	380 – 415V / 50 HZ 460 V / 60 HZ
	1G35	13	6	1	GROUND LEAD

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## EXPLODED VIEW



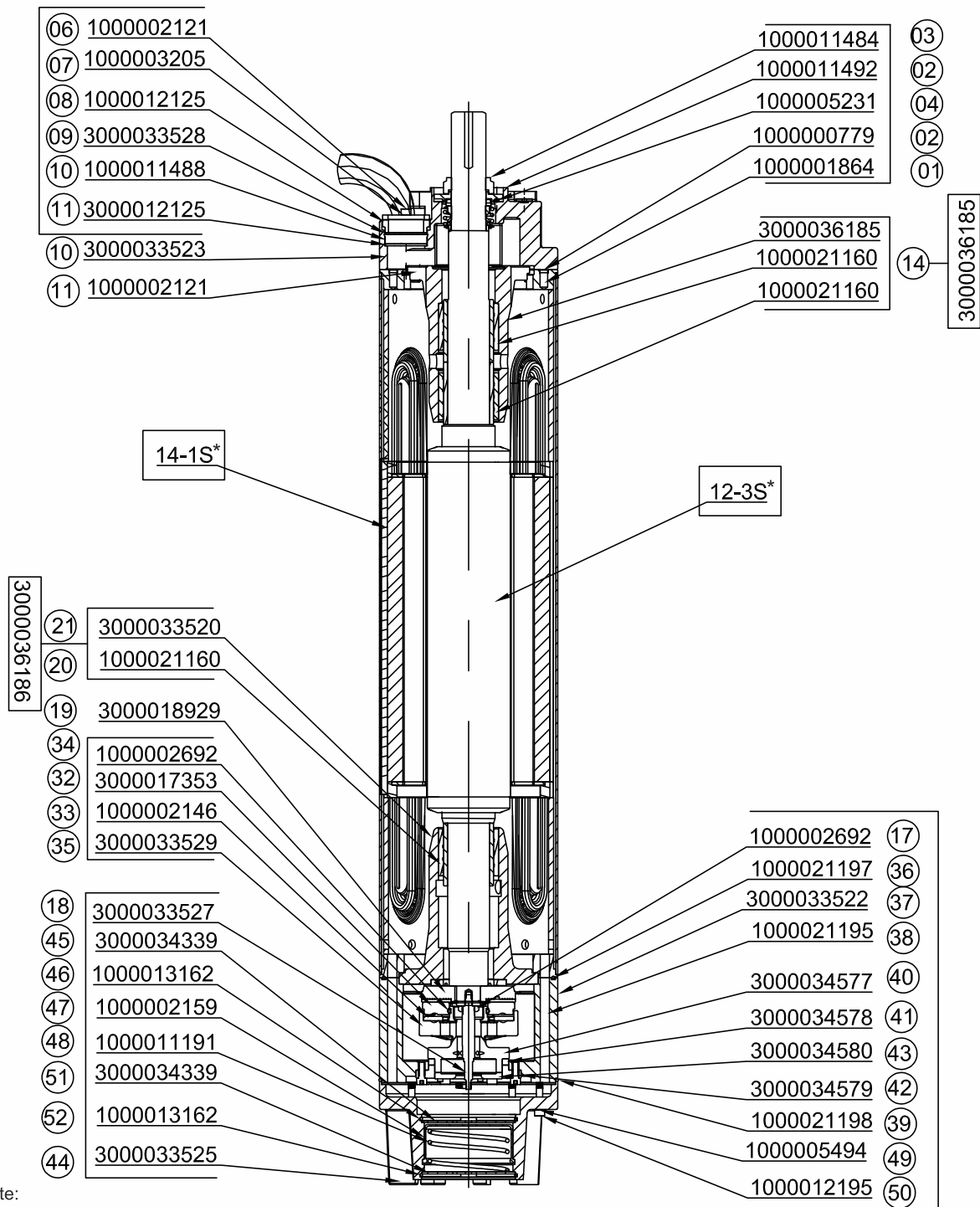
Note:

\* Indicate as per (HP)

## SUBMERSIBLE MOTOR

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## SECTIONAL VIEW





## SUBMERSIBLE MOTOR

Material	CI, Stainless Steel 304/316	Rating	185 kW - 400 kW
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## PART LIST

GROUP	POS	MATERIAL CODE	PART DESCRIPTION	QTY	MATERIAL
	1	1000001864	H H BOLT M16X60 (SS304)	6	AISI SS-304
	2	1000000779	SPRING WASHER M16 (SS-304) (71a)	6	AISI SS-304
	3	1000011484	SAND SLINGER MTSF C-12	1	NBR
	4	1000005231	ALLEN HEAD SCREW M5X8MM ( SS304)	4	AISI SS-304
	5	1000011492	DUST COVER MTSF C-12	1	AISI SS-304
	6	1000002121	ALLEN BOLT M5X10	4	AISI SS-304
	7	3000033526	GROMATE COVER MTSF C-12	2	AISI SS-304
	8	1000012125	CABLE RING MTSF C-12	2	BRASS
	9	3000033528	LEAD SEAL MTSF C-12	2	AISI SS-304
	10	1000011488	GROMATE MTSF C-12	2	NBR
	12	3000033523	ADAPTOR MTSF (C-12) M/C	2	CI FG 260
	13	3000036185	BEARING BODY (U) MTSF C-12	1	CI FG 260
2S 3000036185	14	1000021160	BUSH CARBON 80X96X80	2	IMPRIGATED CARBON
	17	1000002692	M22X2.5PXHEX NUT	1	AISI SS-304
	18	3000033527	IMPELLER SHAFT MTSF C-12 M/C	1	AISI SS-420
	19	3000018929	REVOLVING PLATE ASS. MTSF-(C-10) (16)	1	N/A
4S 3000036186	20	1000021160	BUSH CARBON 80X96X80	1	IMPRIGATED CARBON
	21	3000033520	BEARING BODY (L) MTSF-C-12 M/C	4	AISI SS-304
	22	1000011493	ALLEN BOLT M8X30	4	AISI SS-304
	24	1000011485	MECHANICAL SEALMTSF(C-12) (6)	1	SIC
	25	1000000199	DRAIN PLUG	2	BRASS
	27	1000001340	ALLEN BOLT M8X12 MM (SS-304) (73a)	1	AISI SS-304
	28	3000003205	PRESSURE RELIEF VALVE ASSLY.MTSF150(24)	1	N/A
	30	1000013163	COUPLING KEY MTSF (C-12)	1	AISI SS-304
	31	1000011830	SHAFT KEY MTSF (C-12)	1	AISI SS-304
	32	3000017353	THRUST BRG SEGMENT	6	AISI SS-420
	33	1000002146	THRUST BALL RETAINER	1	LTB
	34	1000002692	O RING(57.3X5)	1	NBR
	35	3000033529	BEARING SEGMENT CARRIER MC MATA SF 12	2	CI FG 260
	36	1000012197	O-RING ID-265.0 X THK-5.0	1	NBR
	37	3000033522	THRUST BEARING HOUSING MTSF (C-12) M/C	1	CI FG 260
	38	1000012196	ALLEN BOLT M12X170 THREAD 25 MM	1	PP
	39	1000012198	O-RING ID-280.0 X THK-5.0	1	NBR
	40	3000034577	IMPELLER HOUSING MTSF C-12	1	AISI SS-304
	41	3000034578	IMPELLER SUPPORT RING MTSF C-12	1	AISI SS-304
	42	3000034579	SUPPORT PLATE IMPELLER HOUSING MTSF-C12	1	AISI SS-304
	43	3000034580	COVER PLATE IMPELLER HOUSING	1	AISI SS-304
	44	3000033525	MOTOR BASE MTSF (C-12) M/C	1	BRASS
	45	3000034339	DIAPHRAM COVER UPPER MTSF (C-12)	2	AISI SS-304
	46	1000013161	STATOR LOCK STRIP MTSF (C-12)		
	47	1000002159	DIAPHRAGM MOTOR MTSF(C-10) (22)	1	RUBBER
	48	1000011191	SPRING DIAPHRAGM MTSF (C-10) (30)	1	N/A
	49	1000005494	PLAIN WASHER M10 (SS304) (71)		AISI SS-304
	50	1000012195	ALLEN BOLT M10X60 THREAD 25MM	1	AISI SS-304
	52	1000013162	WIRE CIRCLIP 156X4 (38)	2	AISI SS-304

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### Rotor Replacement Assly

POS	P <sub>N</sub>	P <sub>N</sub>	ROTOR
	[HP]	[kW]	MODEL NO
12.01	250	185	3000036387
12.02	300	220	3000033532
12.03	340	250	3000033532
12.04	400	300	3000036388
12.05	480	350	3000036389
12.05	540	400	3000036390

### Stator Replacement Assly

POS	P <sub>N</sub>	P <sub>N</sub>	STATOR
	[HP]	[kW]	MODEL NO
12.01	250	185	3000036384
12.02	300	220	3000033533
12.03	340	250	3000033533
12.04	400	300	3000033534
12.05	480	350	3000036385
12.06	540	400	3000036386

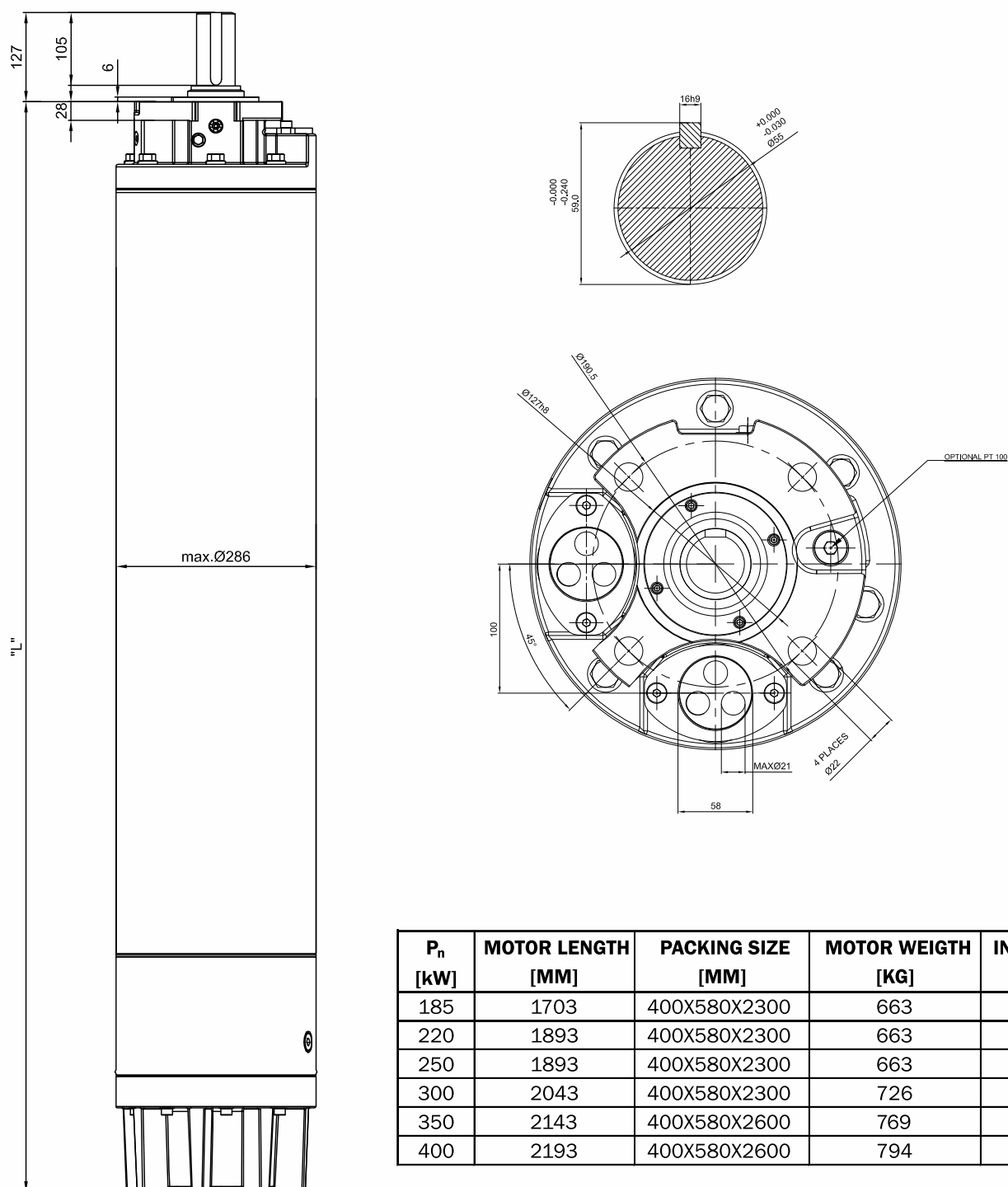
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**PVC Insulation Standard Winding 380-415V 50 Hz / 460 V 60 Hz**

[kW]	Turns per Coil	Wire diameter [mm]	Group Connection	Total Wire Length [m]	Resistance YΔ (U1-U2) [Ω]	Resistance DOL (U1-V1) [Ω]
185	7+8+7+8	2.4/3.8	Parallel Delta	850		
220	5+6+5+6	2.7/4.1	Parallel Delta	700		
250	5+6+5+6	2.7/4.1	Parallel Delta	700		
300	4+5+4+5	3.0/4.5	Parallel Delta	690		
350	4+4+4+5	3.0/4.5	Parallel Delta	650		
400	4+4+4+4	3.4/5.0	Parallel Delta	640		

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## Outline drawings





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