Horizontal Centrifugal Pumps With Magnetic Coupling TMR

Operation & Maintenance Instructions

EN 02

Read these operation and maintenance instructions before start up!
To be held for future reference.

Dosing | Liquids
Conveying | Gases
Control | System

11. Technical data

11.1 Series TMR G2

TMR			50 Hz	06.10						10.10						10.15					
			60 Hz	07.11						07.14						11.15					
∅ Inlet			BSP - NPT	1 1/2"						1 1/2"						1 1/2"					
∅ Outlet			BSP - NPT	1 1/4"						1 1/4"						1 1/4"					
Flange ISO-ANSI-JIS			DNA*	40 - 1 1/2"						40 - 1 1/2"						40 - 1 1/2"					
			DNM *	32 - 1 1/4"						32 - 1 1/4"						32 - 1 1/4"					
Pump			Model	06.10						10.10						10.15					
			Execution	N		P		S		N		P		S		N		P		S	
				WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF
Power (IEC) 50 Hz			kW	0.55		0.75		1.1		0.75		1.1		1.5		1.1		1.5		2.2	
Frame			IEC	71		80A		80B		80A		80B		90S		80B		90S		90L	
Weight of pump	without motor		kg	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
	IEC	3-pole	kg	10	11	11	12	13	14	11	12	13	14	16	17	13	14	16	17	20	21
		E-exd	kg	18	19	23	24	23	24	23	24	23	24	33	34	23	24	33	34	34	35
		1-pole	kg	12	13	14	15	17	18	14	15	17	18	20	21	17	18	20	21	27	28
Noise			dB	65						70						70					
Max. head			m	11						14.5						18					
Max. capacity			m³/h	17						19						25					
Max. NPSH required			m wc																		
Pump			Model	07.11						07.14						11.15					
			Execution	N		P		S		N		P		S		N		P		S	
				WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF
Power (IEC) 60 Hz			kW	0.75		1.1		1.5		1.1		1.5		2.2		1.5		2.2		3	
Frame			IEC	80A		80B		90S		80B		90S		90L		90S		90L		100L	
Power (NEMA) 60 Hz			HP	1		1 1/2		2		1 1/2		2		3		2		3		5	
Frame			NEMA	56		143		145		143		145		182		145		182		184	
Weight of pump	without motor		kg	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
			Lb	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9
	IEC	3-pole	kg	11	12	13	14	16	17	13	14	16	17	20	21	16	17	20	21	25	26
		E-exd	kg	23	24	23	24	33	34	23	24	33	34	34	35	33	34	34	35	44	45
		1-pole	kg	14	15	17	18	20	21	17	18	20	21	27	28	20	21	27	28	–	–
	NEMA	3-pole	Lb	33	35	35	38	48	50	44	46	48	50	86	88	48	50	86	88	91	94
		E-exd	Lb	33	35	35	38	48	50	44	46	48	50	86	88	48	50	86	88	91	94
		1-pole	Lb	37	39	42	44	73	76	66	69	73	76	106	109	73	76	106	109	–	–
Noise			dB	70						70						70					
Max. head			m	15.5						16.5						22					
Max. capacity			m³/h	15						19.5						24					
Max. NPSH required			m wc																		
Phase			N.	Three-phase (all versions) - AC-current (< 3 kW)																	
Standard voltage IEC			V	400 ± 5% 50 Hz																	
Standard voltage NEMA			V	460 ± 5% 60 Hz																	
Protection level			IP	55																	
Loads (ports section)			kg	max. single strength value F(x;y;z) = 2.5																	
Dynamic loads (base)			kg	6.5																	

Series TMR G2

TMR			50 Hz	16.15						16.20						02.30					
			60 Hz	11.23						17.25						03.35					
∅ Inlet			BSP - NPT	1 1/2"						1 1/2"						1 1/2"					
∅ Outlet			BSP - NPT	1 1/4"						1 1/4"						1 1/4"					
Flange ISO-ANSI-JIS			DNA*	40 - 1 1/2"						40 - 1 1/2"						40 - 1 1/2"					
			DNM *	32 - 1 1/4"						32 - 1 1/4"						32 - 1 1/4"					
Pump			Model	16.15						16.20						02.30					
			Execution	N		P		S		N		P		S		N		P		S	
				WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF
Power (IEC) 50 Hz			kW	1.5		2.2		3		2.2		3		–		2.2		3		–	
Frame			IEC	90S		90L		100L		90L		100L		–		90L		100L		–	
Weight of pump	without motor		kg	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
	IEC	3-pole	kg	16	17	20	21	25	26	20	21	25	26	34	35	20	21	25	26	34	35
		E-exd	kg	33	34	34	35	44	45	34	35	44	45	54	55	34	35	44	45	54	55
		1-pole	kg	20	21	27	28	–	–	27	28	–	–	–	–	27	28	–	–	–	–
Noise			dB	70						70						70					
Max. head			m	23.5						26.5						31					
Max. capacity			m³/h	26						30						8					
Max. NPSH required			m wc																		
Pump			Model	11.23						17.25						03.35					
			Execution	N		P		S		N		P		S		N		P		S	
				WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF
Power (IEC) 60 Hz			kW	2.2		3		–		4		–		–		4		–		–	
Frame			IEC	90L		100L		–		112		–		–		112		–		–	
Power (NEMA) 60 Hz			HP	3		5		–		5		–		–		5		–		–	
Frame			NEMA	182		184		–		184		–		–		184		–		–	
Weight of pump	without motor		kg	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
			Lb	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9
	IEC	3-pole	kg	20	21	25	26	–	–	34	35	–	–	–	–	34	35	–	–	–	–
		E-exd	kg	34	35	44	45	–	–	54	55	–	–	–	–	54	55	–	–	–	–
		1-pole	kg	27	28	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	NEMA	3-pole	Lb	86	88	91	94	–	–	91	94	–	–	–	–	91	94	–	–	–	–
		E-exd	Lb	86	88	91	94	–	–	91	94	–	–	–	–	91	94	–	–	–	–
		1-pole	Lb	109	109	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Noise			dB	70						74						74					
Max. head			m	28						36						35					
Max. capacity			m³/h	27						30						10					
Max. NPSH required			m wc																		
Phase			N.	Three-phase (all versions) - AC-current (< 3 kW)																	
Standard voltage IEC			V	400 ± 5% 50 Hz																	
Standard voltage NEMA			V	460 ± 5% 60 Hz																	
Protection level			IP	55																	
Loads (ports section)			kg	max. single strength value F(x;y;z) = 2.5																	
Dynamic loads (base)			kg	11																	

11.2 Series TMR G3

TMR	**50 Hz**	**20.15**			**20.20**			**20.27**			**20.36**		
	60 Hz	**21.18**			**21.25**			**21.28**			**21.43**		
∅ Inlet	BSP - NPT	2"			2"			2"			2"		
∅ Outlet	BSP - NPT	1 1/2"			1 1/2"			1 1/2"			1 1/2"		
Flange ISO-ANSI-JIS	DNA (mm)	50			50			50			50		
	DNM (mm)	40			40			40			40		
Flange ISO-ANSI-JIS	DNA (Inch)	2"			2"			2"			2"		
	DNM (Inch)	1 1/2"			1 1/2"			1 1/2"			1 1/2"		
Pump	Model	**20.15**			**20.20**			**20.27**			**20.36**		
	Execution	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**
Power (IEC) 50 Hz	kW	2.2	3	4	3	4	5.5	4	5.5	7.5	5.5	7.5	–
Frame Motor	IEC	90L	100L	112M	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	–
Noise	dB	70	70	75	70	75	80	75	80	80	80	80	
Pump	Model	**21.18**			**21.25**			**21.28**			**21.43**		
	Execution	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**
Power (IEC) 60 Hz	kW	3	4	5.5	4	5.5	7.5	5.5	7.5	–	7.5	–	–
Frame Motor	IEC	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	–	132SB	–	
Power (NEMA) 60Hz	HP	5	5	7.5	5	7.5	10	7.5	10	–	10	–	–
Frame Motor	NEMA	184T	184T	213T	184T	213T	215T	213T	215T	–	215T	–	–
Noise	dB	70	75	80	75	80	80	80	80	–	80	–	
Phase	N.	Three-phase											
Standard voltage IEC	V	400 ± 5% 50 Hz											
Standard voltage NEMA	V	460 ± 5% 60 Hz											
Protection level	IP	55											
Loads (protection flange - thread)	kg	max. single strength value F(x;y;z) = 2.5											
Loads (protection flange - flange)	kg	max. single strength value F(x;y;z) = 3.5											

Series TMR G3

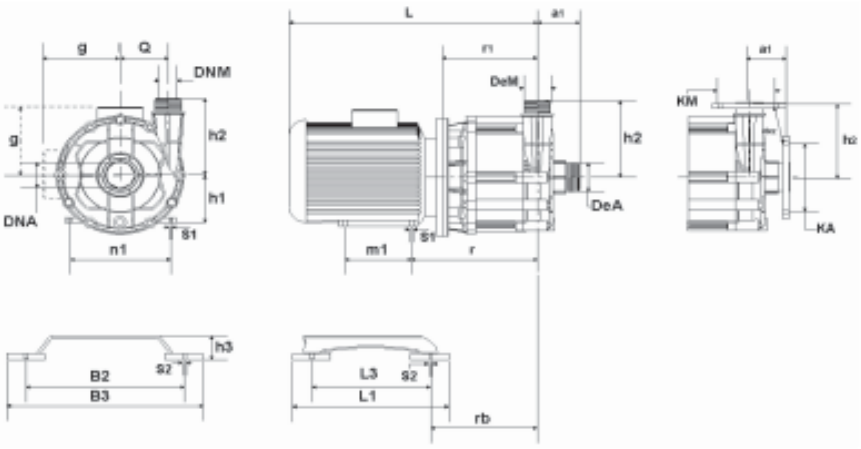
TMR	50 Hz	30.15			30.25			36.30			04.45		
	60 Hz	31.22			31.30						05.55		
∅ Inlet	BSP - NPT	2"			2"			2"			2"		
∅ Outlet	BSP - NPT	1 1/2"			1 1/2"			1 1/2"			1 1/2"		
Flange ISO-ANSI-JIS	DNA (mm)	50			50			50			50		
	DNM (mm)	40			40			40			40		
Flange ISO-ANSI-JIS	DNA (Inch)	2"			2"			2"			2"		
	DNM (Inch)	1 1/2"			1 1/2"			1 1/2"			1 1/2"		
Pump	Model	30.15			30.25			36.30			04.45		
	Execution	N	P	S	N	P	S	N	P	S	N	P	S
Power (IEC) 50 Hz	kW	4	5.5	7.5	5.5	7.5	–	7.5	–	–	5.5	7.5	–
Frame Motor	IEC	112M	132SA	132SB	132SA	132SB	–	132SB	–	–	112M	132SA	–
Noise	dB	75	80	80	80	80	–	80	–	–	75	80	–
Pump	Model	31.22			31.30						05.55		
	Execution	N	P	S	N	P	S				N	P	S
Power (IEC) 60 Hz	kW	5.5	7.5	–	7.5	–	–				7.5	–	–
Frame Motor	IEC	132SA	132SB	–	132SB	–	–				132SB	–	–
Power (NEMA) 60Hz	HP	7.5	10	–	10	–	–				10	–	–
Frame Motor	NEMA	213T	215T	–	215T	–	–				215T	–	–
Noise	dB	80	80	–	80	–	–				80	–	–
Phase	N.	Three-phase											
Standard voltage IEC	V	400 ± 5% 50 Hz											
Standard voltage NEMA	V	460 ± 5% 60 Hz											
Protection level	IP	55											
Loads (protection flange - thread)	kg	max. single strength value F (x,y,z) = 2.5											
Loads (protection flange - flange)	kg	max. single strength value F (x,y,z) = 3.5											

12. Dimensions

12.1 Series TMR G2

IEC-Motors 50 Hz

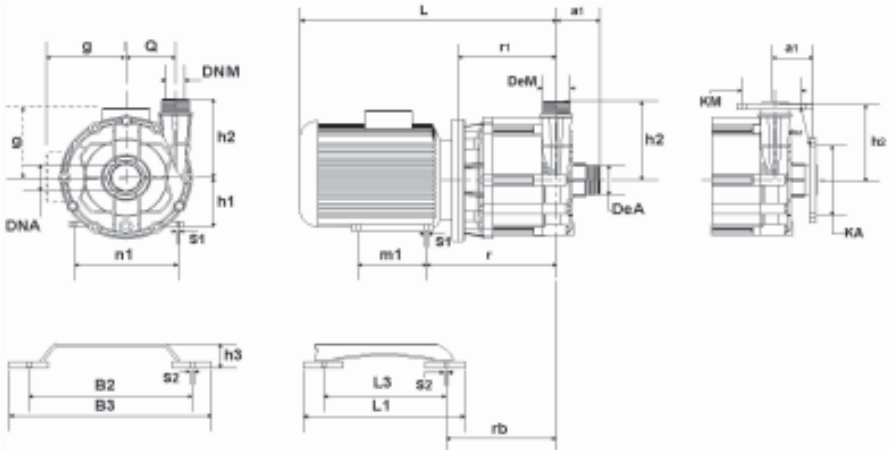
TMR G2	06.10			10.10			10.15			16.15			16.20		02.30	
IEC-Baugröße / IEC-frame	71	80A	80B	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100	90L	100
De M (BSP/NPT)	1 1/4"			1 1/4"			1 1/4"			1 1/4"			1 1/4"		1 1/4"	
De A (BSP/NPT)	1 1/2"			1 1/2"			1 1/2"			1 1/2"			1 1/2"		1 1/2"	
DNM	32			32			32			32			32		32	
DNA	40			40			40			40			40		40	
a1	67			67			67			67			67		67	
L	356	385		385		405	385	405	430	405	430	478	430	478	430	
Q	75			75			75			75			75		75	
h1	71	80		80		90	80	90		90		100	90	100	90	
h2	130			130			130			130			130		130	
r	194	199		199		205	199	205		205		227	205	227	205	
r1	149			149			149			149		164	149	164	149	164
rb	161			161			161			161		176	161	176	161	176
m1	90	100		100			100	125		100	125	140	125	140	125	
n1	112	125		125		140	125	140		140		160	140	160	140	
s1	7	8		8			8			8		10	8	10	8	
g	106	110		110		142	110	142		142		155	142	155	142	
L3	185			185			185			185		205	185	205	185	205
B2	248			248			248			248		305	248	305	248	305
S2	14			14			14			14			14		14	
L1	245			245			245			245		265	245	265	245	265
B3	308			308			308			308		365	308	365	308	365
h3	40			40			40			40			40		40	
KM (ISO)	100			100			100			100			100		100	
KA (ISO)	110			110			110			110			110		110	
KM (ANSI)	89			89			89			89			89		89	
KA (ANSI)	98			98			98			98			98		98	
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4			18 x 4		18 x 4	
d x z (ANSI)	16 x 4			16 x 4			16 x 4			16 x 4			16 x 4		16 x 4	



Series TMR G2

IEC-Motors 60 Hz

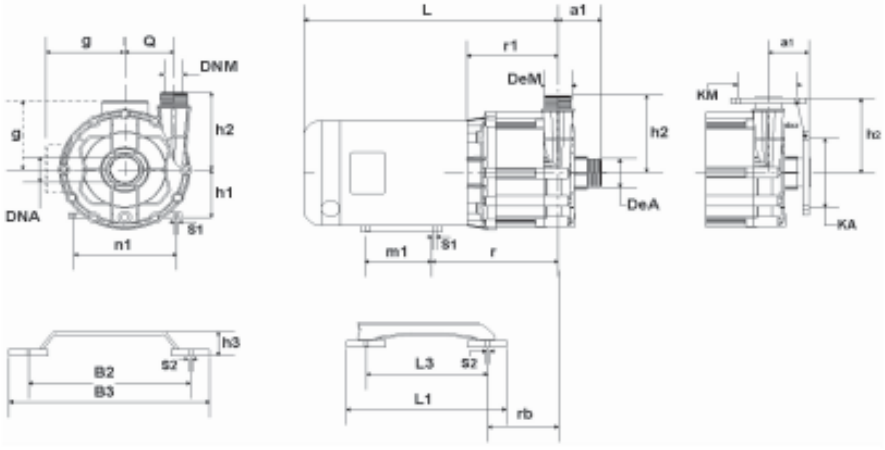
TMR G2	07.11			07.14			11.15			11.23		17.25	03.35
IEC-Baugröße / IEC-frame	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100	112	112
De M (BSP/NPT)	1 1/4"			1 1/4"			1 1/4"			1 1/4"		1 1/4"	1 1/4"
De A (BSP/NPT)	1 1/2"			1 1/2"			1 1/2"			1 1/2"		1 1/2"	1 1/2"
DNM	32			32			32			32		32	32
DNA	40			40			40			40		40	40
a1	67			67			67			67		67	67
L	385		405	385	405	430	405	430	478	430	478	487	487
Q	75			75			75			75		75	75
h1	80		90	80	90		90		100	90	100	112	112
h2	130			130			130			130		130	130
r	199		205	199	205		205		227	205	227	234	234
r1	149			149			149		164	149	164	164	164
rb	161			161			161		176	161	176	176	176
m1	100			100		125	100	125	140	125	140	140	140
n1	125		140	125	140		140		160	140	160	190	190
s1	8			8			8		10	8	10	10	10
g	110		142	110	142		142		155	142	155	168	168
L3	185			185			185		205	185	205	205	205
B2	248			248			248		305	248	305	305	305
S2	14			14			14			14		14	14
L1	245			245			245		265	245	265	265	265
B3	308			308			308		365	308	365	365	365
h3	40			40			40			40		40	40
KM (ISO)	100			100			100			100		100	100
KA (ISO)	110			110			110			110		110	110
KM (ANSI)	89			89			89			89		89	89
KA (ANSI)	98			98			98			98		98	98
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4		18 x 4	18 x 4
d x z (ANSI)	16 x 4			16 x 4			16 x 4			16 x 4		16 x 4	16 x 4



Series TMR G2

NEMA-Motors 60 Hz

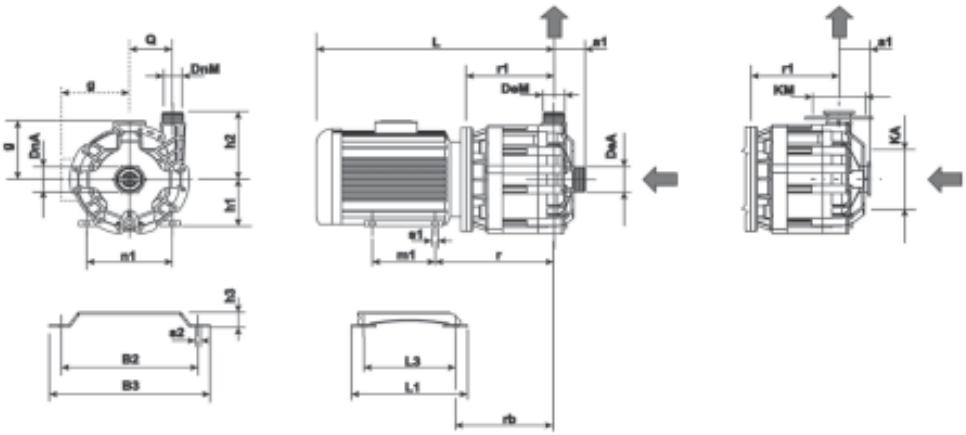
TMR G2	07.11		07.14			11.15			11.23		17.25	03.35
NEMA-Baugröße / NEMA-frame	56	145	143	145	182	145	182	184	182	184	184	184
De M (BSP/NPT)	1 1/4"		1 1/4"			1 1/4"			1 1/4"		1 1/4"	1 1/4"
De A (BSP/NPT)	1 1/2"		1 1/2"			1 1/2"			1 1/2"		1 1/2"	1 1/2"
DNM	1 1/4		1 1/4			1 1/4			1 1/4		1 1/4	1 1/4
DNA	1 1/2		1 1/2			1 1/2			1 1/2		1 1/2	1 1/2
a1	2 21/32		2 21/32			2 21/32			2 21/32		2 21/32	2 21/32
L	14 15/16	16 15/16	15 15/16	16 15/16	18 1/2	16 15/16	18 1/2	19 1/2	18 1/2	19 1/2	19 1/2	19 1/2
Q	2 15/16		2 15/16			2 15/16			2 15/16		2 15/16	2 15/16
h1	3 1/2		3 1/2		4 1/2	3 1/2	4 1/2		4 1/2		4 1/2	4 1/2
h2	5 1/8		5 1/8			5 1/8			5 1/8		5 1/8	5 1/8
r	8 7/16	8 1/8	8 1/8		9 3/8	8 1/8	9 3/8		9 3/8		9 5/8	9 5/8
r1	5 7/8		5 7/8		6 5/8	5 7/8	6 5/8		6 5/8		6 5/8	6 5/8
rb	6 11/32		6 11/32		7 1/8	6 11/32	7 1/8		7 1/8		7 1/8	7 1/8
m1	3	5	4	5	4 1/2	5	4 1/2	5 1/2	4 1/2	5 1/2	5 1/2	5 1/2
n1	4 7/8	5 1/2	5 1/2		7 1/2	5 1/2	7 1/2		7 1/2		7 1/2	7 1/2
s1	3/8		3/8		13/32	3/8	13/32		13/32		13/32	13/32
g	5 7/16	5 29/32	5 29/32		7 1/32	5 29/32	7 1/32		7 1/32		7 1/32	7 1/32
L3	7 9/32		7 9/32		8 1/16	7 9/32	8 1/16		8 1/16		8 1/16	8 1/16
B2	9 3/4		9 3/4		12	9 3/4	12		12		12	12
S2	9/16		9/16			9/16			9/16		9/16	9/16
L1	9 21/32		9 21/32		10 3/16	9 21/32	10 3/16		10 3/16		10 3/16	10 3/16
B3	12 1/8		12 1/8		14 1/8	12 1/8	14 1/8		14 1/8		14 1/8	14 1/8
h3	1 9/16		1 9/16			1 9/16			1 9/16		1 9/16	1 9/16
KM (ISO)	3 15/16		3 15/16			3 15/16			3 15/16		3 15/16	3 15/16
KA (ISO)	4 11/32		4 11/32			4 11/32			4 11/32		4 11/32	4 11/32
KM (ANSI)	3 1/2		3 1/2			3 1/2			3 1/2		3 1/2	3 1/2
KA (ANSI)	3 7/8		3 7/8			3 7/8			3 7/8		3 7/8	3 7/8
d x z (ISO)	3/4 x 4		3/4 x 4			3/4 x 4			3/4 x 4		3/4 x 4	3/4 x 4
d x z (ANSI)	5/8 x 4		5/8 x 4			5/8 x 4			5/8 x 4		5/8 x 4	5/8 x 4



12.2 Series TMR G3

IEC-Motors 50 Hz

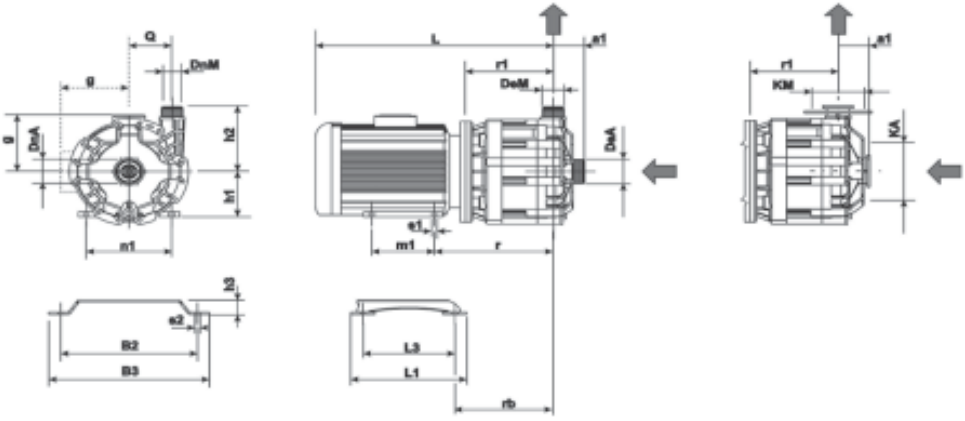
TMR G3	20.15			20.20			20.27			20.36		30.15			30.25		36.30	04.45	
IEC-Baugröße / IEC-frame	90L	100L	112M	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	112M	132SA	132SB	132SA	132SB	132SB	132SA	132SB
De M (BSP/NPT)	1 1/2"			1 1/2"			1 1/2"			1 1/2"		1 1/2"			1 1/2"		1 1/2"	1 1/2"	
De A (BSP/NPT)	2"			2"			2"			2"		2"			2"		2"	2"	
DNM	40			40			40			40		40			40		40	40	
DNA	50			50			50			50		50			50		50	50	
a1	70			70			70			70		70			70		70	70	
L	489	512	521	512	521	578	521	578		578		521	578		578		578	578	
Q	96			96			96			96		96			96		96	96	
h1	90	100	112	100	112	132	112	132		132		112	132		132		132	132	
h2	160			160			160			160		160			160		160	160	
r	244	261	268	261	268	307	268	307		307		268	307		307		307	307	
r1	188	198		198		218	198	218		218		198	218		218		218	218	
rb	200	210	217	210	217	235	217	235		235		217	235		235		235	235	
m1	125	140		140			140			140		140			140		140	140	
a1	140	160	190	160	190	216	190	216		216		190	216		216		216	216	
s1	8	10		10			10			10		10			10		10	10	
g	142	155	168	155	168	181	168	181		181		168	181		181		181	181	
L3	185	205		205		263	205	263		263		205	263		263		263	263	
B2	248	305		305		359	305	359		359		305	359		359		359	359	
s2	14			14			14			14		14			14		14	14	
L1	245	265		265		333	265	333		333		265	333		333		333	333	
B3	308	365		365		429	365	429		429		365	429		429		429	429	
h3	55			55			55			55		55			55		55	55	
KM (ISO)	110			110			110			110		110			110		110	110	
KA (ISO)	125			125			125			125		125			125		125	125	
KM (ANSI)	98			98			98			98		98			98		98	98	
KA (ANSI)	121			121			121			121		121			121		121	121	
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4		18 x 4			18 x 4		18 x 4	18 x 4	
d x z (ANSI)	16-19 x 4			16-19 x 4			16-19 x 4			16-19 x 4		16-19 x 4			16-19 x 4		16-19 x 4	16-19 x 4	



Series TMR G3

IEC-Motors 60 Hz

TMR G3	21.18			21.25			21.28		21.43	31.22		31.30	05.55
IEC-Baugröße / IEC-frame	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	132SB	132SA	132SB	132SB	132SB
De M (BSP/NPT)	1 1/2"			1 1/2"			1 1/2"		1 1/2"	1 1/2"		1 1/2"	1 1/2"
De A (BSP/NPT)	2"			2"			2"		2"	2"		2"	2"
DNM	40			40			40		40	40		40	40
DNA	50			50			50		50	50		50	50
a1	70			70			70		70	70		70	70
L	512	521	578	521	578		578		578	578		578	578
Q	96			96			96		96	96		96	96
h1	100	112	132	112	132		132		132	132		132	132
h2	160			160			160		160	160		160	160
r	261	268	307	268	307		307		307	307		307	307
r1	198		218	198	218		218		218	218		218	218
rb	210	217	235	217	235		235		235	235		235	235
m1	140			140			140		140	140		140	140
n1	160	190	216	190	216		216		216	216		216	216
s1	10			10			10		10	10		10	10
g	155	168	181	168	181		181		181	181		181	181
L3	205		263	205	263		263		263	263		263	263
B2	305		359	305	359		359		359	359		359	359
S2	14			14			14		14	14		14	14
L1	265		333	265	333		333		333	333		333	333
B3	365		429	365	429		429		429	429		429	429
h3	55			55			55		55	55		55	55
KM (ISO)	110			110			110		110	110		110	110
KA (ISO)	125			125			125		125	125		125	125
KM (ANSI)	98			98			98		98	98		98	98
KA (ANSI)	121			121			121		121	121		121	121
d x z (ISO)	18 x 4			18 x 4			18 x 4		18 x 4	18 x 4		18 x 4	18 x 4
d x z (ANSI)	16-19 x 4			16-19 x 4			16-19 x 4		16-19 x 4	16-19 x 4		16-19 x 4	16-19 x 4



Series TMR G3

NEMA-Motors 60 Hz

TMR G3	21.18		21.25			21.28		21.43	31.22		31.30	05.55
NEMA-Baugröße / NEMA-frame	184T	213T	184T	213T	215T	213T	215T	215T	213T	215T	215T	215T
De M (BSP/NPT)	1 1/2"		1 1/2"			1 1/2"		1 1/2"	1 1/2"		1 1/2"	1 1/2"
De A (BSP/NPT)	2"		2"			2"		2"	2"		2"	2"
DNM	1 1/2		1 1/2			1 1/2		1 1/2	1 1/2		1 1/2	1 1/2
DNA	2		2			2		2	2		2	2
a1	2 3/4		2 3/4			2 3/4		2 3/4	2 3/4		2 3/4	2 3/4
L	20 13/16	23 1/8	20 13/16	23 1/8		23 1/8		23 1/8	23 1/8		23 1/8	23 1/8
Q	3 3/4		3 3/4			3 3/4		3 3/4	3 3/4		3 3/4	3 3/4
h1	4 1/4	5 1/4	4 1/4	5 1/4		5 1/4		5 1/4	5 1/4		5 1/4	5 1/4
h2	6 1/4		6 1/4			6 1/4		6 1/4	6 1/4		6 1/4	6 1/4
r	10 15/16	11 11/16	10 15/16	11 11/16		11 11/16		11 11/16	11 11/16		11 11/16	11 11/16
r1	8 1/16	8 11/16	8 1/16	8 11/16		8 11/16		8 11/16	8 11/16		8 11/16	8 11/16
rb	8 5/8	8 3/4	8 5/8	8 3/4		8 3/4		8 3/4	8 3/4		8 3/4	8 3/4
m1	5 1/2		5 1/2		7	5 1/2	7	7	5 1/2	7	7	7
n1	7 1/2	8 1/2	7 1/2	8 1/2		8 1/2		8 1/2	8 1/2		8 1/2	8 1/2
s1	13/32		13/32			13/32		13/32	13/32		13/32	13/32
g	7	8	7	8		8		8	8		8	8
L3	8 1/16	10 3/8	8 1/16	10 3/8		10 3/8		10 3/8	10 3/8		10 3/8	10 3/8
B2	12	14 1/8	12	14 1/8		14 1/8		14 1/8	14 1/8		14 1/8	14 1/8
S2	9/16		9/16			9/16		9/16	9/16		9/16	9/16
L1	10 3/16	13 1/8	10 3/16	13 1/8		13 1/8		13 1/8	13 1/8		13 1/8	13 1/8
B3	14 1/8	16 7/8	14 1/8	16 7/8		16 7/8		16 7/8	16 7/8		16 7/8	16 7/8
h3	2 5/32		2 5/32			2 5/32		2 5/32	2 5/32		2 5/32	2 5/32
KM (ISO)	4 11/32		4 11/32			4 11/32		4 11/32	4 11/32		4 11/32	4 11/32
KA (ISO)	4 15/16		4 15/16			4 15/16		4 15/16	4 15/16		4 15/16	4 15/16
KM (ANSI)	3 7/8		3 7/8			3 7/8		3 7/8	3 7/8		3 7/8	3 7/8
KA (ANSI)	4 3/4		4 3/4			4 3/4		4 3/4	4 3/4		4 3/4	4 3/4
d x z (ISO)	3/4 x 4		3/4 x 4			3/4 x 4		3/4 x 4	3/4 x 4		3/4 x 4	3/4 x 4
d x z (ANSI)	5/8-3/4 x 4		5/8-3/4 x 4			5/8-3/4 x 4		5/8-3/4 x 4	5/8-3/4 x 4		5/8-3/4 x 4	5/8-3/4 x 4