SANWA PUMP

Sanwa Stainless Steel Magnetic Drive Pumps

META SERIES

Seal-less Magnet Drive Pumps.
Stainless steel made.
Closed coupled type.

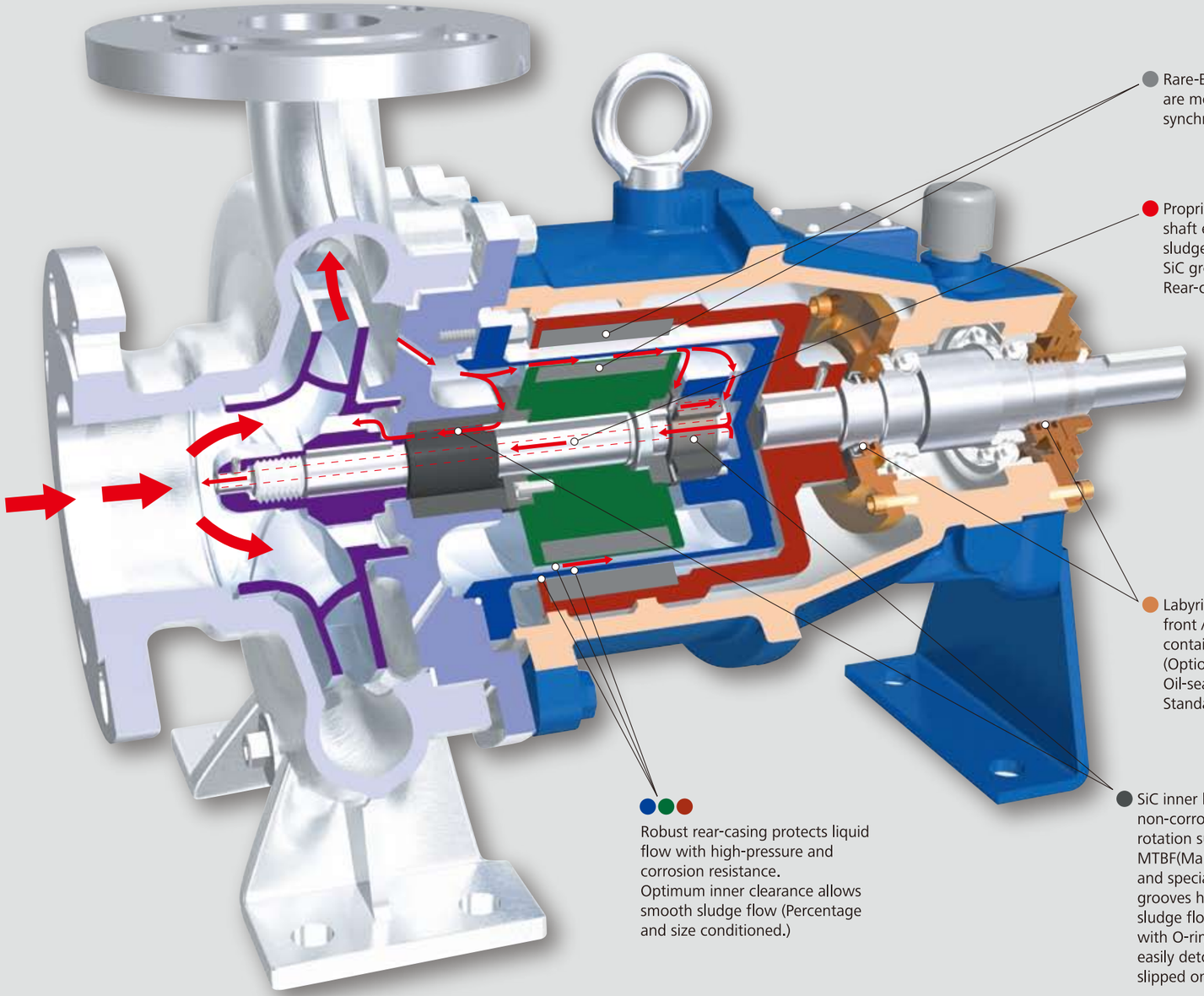
Application Range

- MAX. Bore Size ; 200/150mm
- Max. capacity ; 9,000ℓ/min
- Max. total head ; 130m
- Max. Motor Output ; 110kW
- Temperature Range ; −100~450℃
- Material ; 304SS, 316SS
  Alloy20
  Has-Ceq、Ti
- Wet Bearing ; SiC
- Magnet ; Rare Earth(Nd/SmCo)

MANUFACTURER SANWA HYDROTECH CORPORATION

www.sanwapump.com

www.sanwapump.co.jp



Rare-Earth Nd Magnets are mounted for non-slip synchronized operation.

Proprietary rifle-holed shaft enables smooth sludge flow with help of SiC grooves and Rear-casing.

Labyrinth-Seals mounted front / rear side perfectly contain the oil bath. (Option)
Oil-seals are applied as Standard.

SiC inner bearings enable non-corrosion / erosion rotation support with long MTBF(Maintenance interval), and specially designed grooves help to make easy sludge flow. Never coupled with O-rings, the SiC parts are easily detouched and easily slipped onto the shaft.

Robust rear-casing protects liquid flow with high-pressure and corrosion resistance.
Optimum inner clearance allows smooth sludge flow (Percentage and size conditioned.)

EXTENSIVE HYDRAULIC PERFORMANCE

META series widely cover motor capacity up to 110kW with 200x150mm Max bore size.

Three features of Magnetic drive pumps

1st feature : No leaks, at all, of any kind

Seal pumps inevitably leak from the seal due to the construction of shaft seal.
In order to eliminate this problem, the seal-less magnetic drive pumps eliminate the power-transfer shaft, which is connected to the impeller directly. Instead, magnetic drive pumps are designed to perform power-transfer with a permanent magnet through the wall of pump rear casing. No shaft seal is required and therefore no-leak. This no-leak feature makes it reliable and safe.

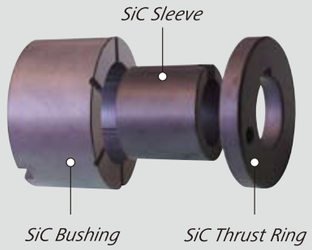
2nd feature : Tough and highly durable

The working temperature and pressure range of seal-less magnetic drive pump is much wider than that of conventional seal pump.
Seal pumps have limited resistance to heat & cold and low pressure withstanding capability due to the shaft seal.

3rd feature : Easy to maintain

The magnetic drive pumps have a long MTBF (Mean Time Between Failure) rating. Simple and compact design provides easy maintenance.

SiC inner bearing



META SERIES

Yes, we make sealless pumps that eliminate leakage!

Contents

CLOSE COUPLED

STAINLESS STEEL MAGNETIC DRIVE PUMP

TYPE MTFO

Motor Output

Max.22kW

[PUMP TYPE IDENTIFICATION]

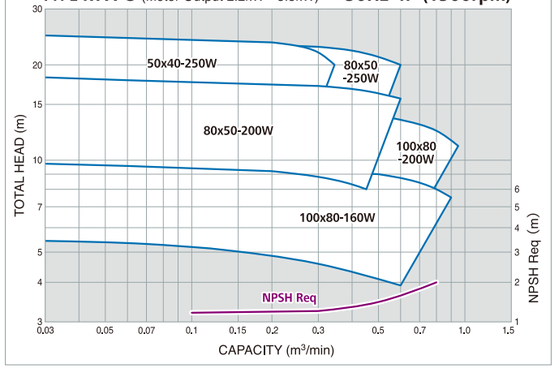
MTFO 40 x 25 – 160 W
① ② ③ ④ ⑤

① PUMP TYPE	…	MTFO
② SUCTION BORE	…	40 ~ 100 (mm)
③ DISCHARGE BORE	…	25 ~ 80 (mm)
④ IMPELLER NOMINAL DIAMETER	…	160, 200, 250
⑤ DRIVE UNIT TYPE	…	TYPE-W

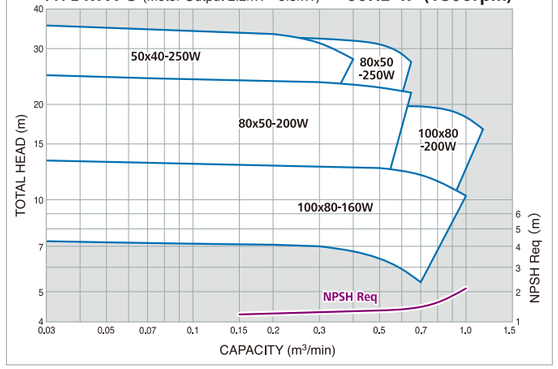
SHUT OUT LEAKS · STAINLESS STEEL · HIGH TEMP 280C OK! · LOW TEMP -80C OK! · EASY MAINTENANCE · HIGHLY RELIABLE · HIGHLY DURABLE · BROAD BAND PERFORMANCE · QUICK LEADTIME

Selection charts

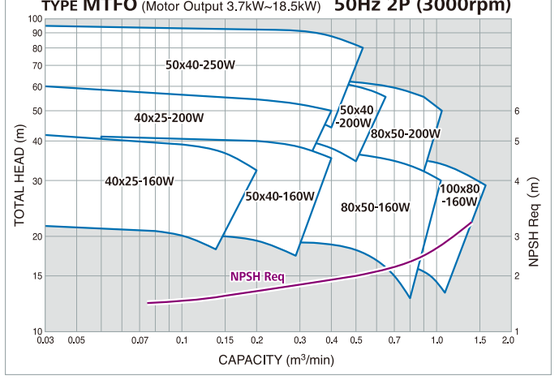
TYPE MTFO (Motor Output 2.2kW~5.5kW) **50Hz 4P (1500rpm)**



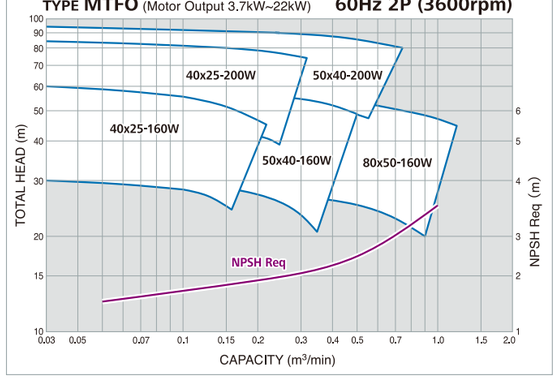
TYPE MTFO (Motor Output 2.2kW~5.5kW) **60Hz 4P (1800rpm)**



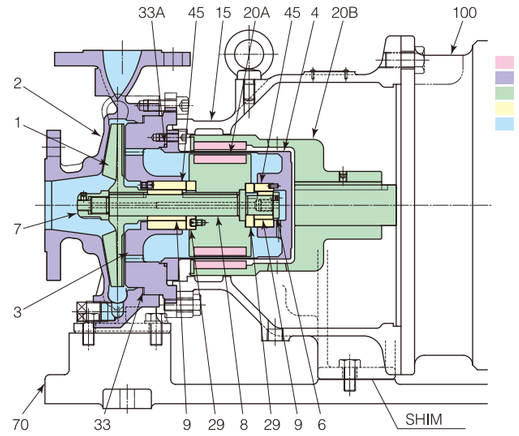
TYPE MTFO (Motor Output 3.7kW~18.5kW) **50Hz 2P (3000rpm)**



TYPE MTFO (Motor Output 3.7kW~22kW) **60Hz 2P (3600rpm)**

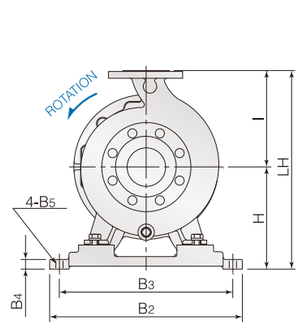


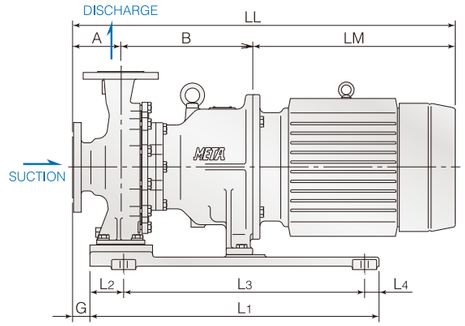
Construction and materials



MARK	NAME OF PART	MAT'L	No.REQ'D
100	MOTOR	–	1
70	BASE PLATE	CAST IRON or STEEL	1
45	BUSHING	SiC	1+1
33A	O RING	PTFE	1
33	GASKET	PTFE	1
29	THRUST RING	SiC	1+1
20B	MAGNET COUPLING(M)	CAST IRON	1
20A	MAGNET COUPLING(P)	304SS or 316SS	1
15	FRAME ADAPTER	CAST IRON	1
9	SLEEVE	SiC	1+1
8	INNER MAGNET SHAFT	304SS or 316SS	1
7	IMPELLER NUT	304SS or 316SS	1
6	SLEEVE BOLT	304SS or 316SS	1
4	REAR CASING	304SS or 316SS	1
3	CASING COVER	304SS or 316SS	1
2	CASING	304SS or 316SS	1
1	IMPELLER	304SS or 316SS	1

Outline dimension





(In the unit of mm)

PUMP SIZE	MOTOR FRAME	PUMP						BASE PLATE & MOTOR										MASS APPROX(kg)		
		A	B	I	H	LH	G	L1	L2	L3	L4	B2	B3	B4	B5	LM	LL	PUMP	MOTOR	TOTAL
40x25–160W	112M	80	238	150	210	360	0	600	70	500	30	400	360	20	φ15	326	644	59	36	95
	132S,132M	80	258	150	210	360	0	600	70	500	30	400	360	20	φ15	369.5	707.5	66	63	129
	160M,160L	80	288	150	210	360	0	600	70	500	30	400	360	20	φ15	503	871	73	109	182
	180M,180L	80	288	150	310	460	0	660	60	550	50	410	360	16	φ20	528.5	896.5	79	205	284
40x25–200W	112M	80	238	180	210	390	0	600	70	500	30	400	360	20	φ15	326	644	64	36	100
	132S,132M	80	258	180	210	390	0	600	70	500	30	400	360	20	φ15	369.5	707.5	71	63	134
	160M,160L	80	288	180	210	390	0	600	70	500	30	400	360	20	φ15	503	871	78	109	187
	180M,180L	80	288	180	310	490	0	660	60	550	50	410	360	16	φ20	528.5	896.5	86	205	291
50x40–160W	112M	80	238	160	210	370	0	600	70	500	30	400	360	20	φ15	326	644	62	36	98
	132S,132M	80	258	160	210	370	0	600	70	500	30	400	360	20	φ15	369.5	707.5	70	63	133
	160M,160L	80	288	160	210	370	0	600	70	500	30	400	360	20	φ15	503	871	77	109	186
	180M,180L	80	288	160	310	470	0	660	60	550	50	410	360	16	φ20	528.5	896.5	83	205	288
50x40–200W	112M	80	238	180	210	390	0	600	70	500	30	400	360	20	φ15	326	644	67	36	103
	132S,132M	80	258	180	210	390	0	600	70	500	30	400	360	20	φ15	369.5	707.5	75	63	138
	160M,160L	80	288	180	210	390	0	600	70	500	30	400	360	20	φ15	503	871	81	109	190
	180M,180L	80	288	180	310	490	0	660	60	550	50	410	360	16	φ20	528.5	896.5	89	205	294
50x40–250W	112M	100	254	225	210	435	36	600	70	500	30	400	360	20	φ15	326	680	86	36	122
	132S,132M	100	274	225	210	435	36	600	70	500	30	400	360	20	φ15	369.5	743.5	94	63	157
	160M,160L	100	304	225	210	435	36	600	70	500	30	400	360	20	φ15	503	907	100	109	209
	180M,180L	100	304	225	310	535	36	660	60	550	50	410	360	16	φ20	528.5	932.5	108	205	313
80x50–160W	112M	100	238	180	210	390	20	600	70	500	30	400	360	20	φ15	326	664	66	36	102
	132S,132M	100	258	180	210	390	20	600	70	500	30	400	360	20	φ15	369.5	727.5	74	63	137
	160M,160L	100	288	180	210	390	20	600	70	500	30	400	360	20	φ15	503	891	81	109	190
	180M,180L	100	288	180	310	490	20	660	60	550	50	410	360	16	φ20	528.5	916.5	89	205	294
80x50–200W	112M	100	254	200	210	410	36	600	70	500	30	400	360	20	φ15	326	680	75	36	111
	132S,132M	100	274	200	210	410	36	600	70	500	30	400	360	20	φ15	369.5	743.5	82	63	145
	160M,160L	100	304	200	210	410	36	600	70	500	30	400	360	20	φ15	503	907	89	109	198
	180M,180L	100	304	200	310	510	36	660	60	550	50	410	360	16	φ20	528.5	932.5	97	205	302
80x50–250W	112M	125	254	225	210	435	61	600	70	500	30	400	360	20	φ15	326	705	90	36	126
	132S,132M	125	274	225	210	435	61	600	70	500	30	400	360	20	φ15	369.5	768.5	98	63	161
	160M,160L	125	304	225	210	435	61	600	70	500	30	400	360	20	φ15	503	932	104	109	213
	180M,180L	125	304	225	310	535	61	660	60	550	50	410	360	16	φ20	528.5	957.5	112	205	317
100x80–160W	112M	100	254	200	210	410	36	600	70	500	30	400	360	20	φ15	326	680	80	36	116
	132S,132M	100	274	200	210	410	36	600	70	500	30	400	360	20	φ15	369.5	743.5	88	63	151
	160M,160L	100	304	200	210	410	36	600	70	500	30	400	360	20	φ15	503	907	95	109	204
	180M,180L	100	304	200	310	510	36	660	60	550	50	410	360	16	φ20	528.5	932.5	103	205	308
100x80–200W	112M	100	254	225	210	435	36	600	70	500	30	400	360	20	φ15	326	680	79	36	115
	132S,132M	100	274	225	210	435	36	600	70	500	30	400	360	20	φ15	369.5	743.5	87	63	150
	160M,160L	100	304	225	210	435	36	600	70	500	30	400	360	20	φ15	503	907	93	109	202
	180M,180L	100	304	225	310	535	36	660	60	550	50	410	360	16	φ20	528.5	932.5	101	205	306

OPEN COUPLED

STAINLESS STEEL MAGNETIC DRIVE PUMP

TYPE MET

Motor Output

Max.110kW

[PUMP TYPE IDENTIFICATION]

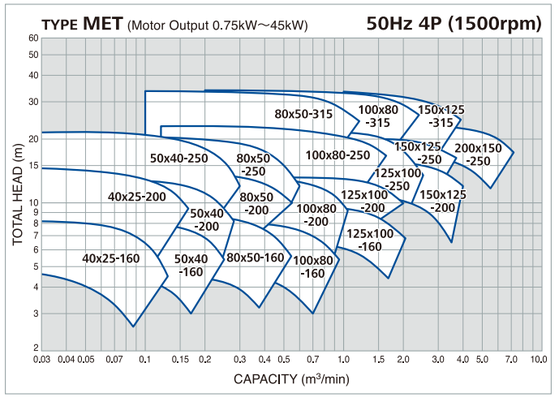
MET 40 x 25 – 160 U

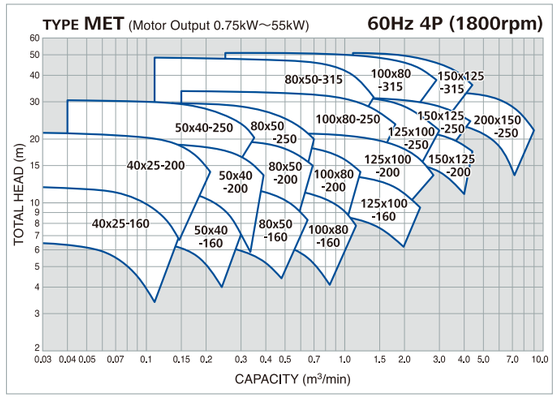
① ② ③ ④ ⑤

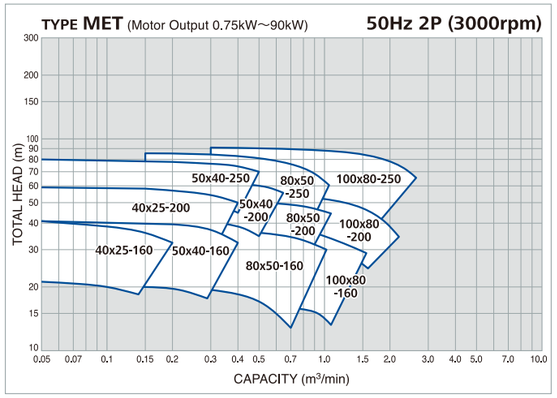
① PUMP TYPE	…	MET
② SUCTION BORE	…	40 ~ 200 (mm)
③ DISCHARGE BORE	…	25 ~ 150 (mm)
④ IMPELLER NOMINAL DIAMETER	…	160, 200, 250, 315
⑤ DRIVE UNIT TYPE	…	TYPE-U or G or L

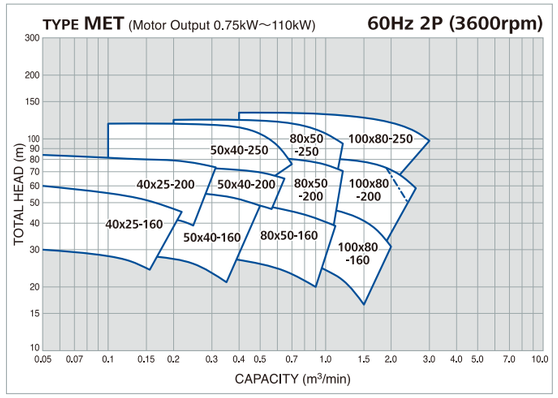
SHUT OUT LEAKS · STAINLESS STEEL · HIGH TEMP 450°C OK! · LOW TEMP -100°C OK! · EASY MAINTENANCE · HIGHLY RELIABLE · HIGHLY DURABLE · ISO2858 STANDARD · BROAD BAND PERFORMANCE

Selection charts

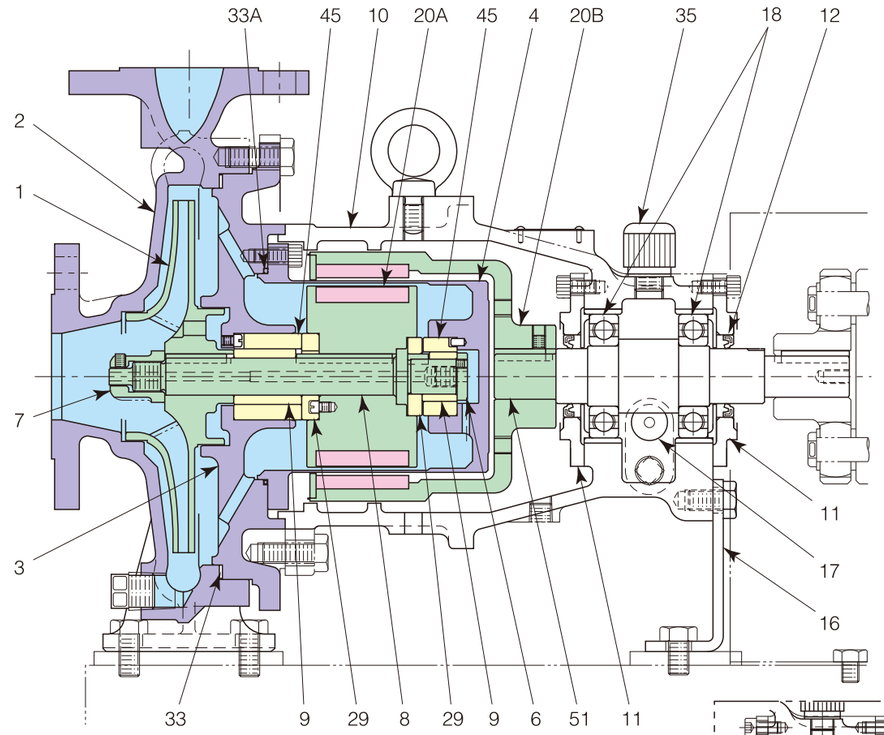


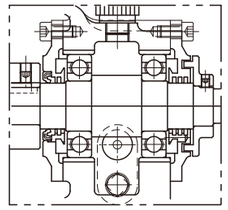






Construction and materials





Labyrinth-seal (Option)

MARK	NAME OF PART	MAT'L	No.REQ'D
9	SLEEVE	SiC	1+1
8	INNER MAGNET SHAFT	304SS or 316SS	1
7	IMPELLER NUT	304SS or 316SS	1
6	SLEEVE BOLT	304SS or 316SS	1
4	REAR CASING	304SS or 316SS	1
3	CASING COVER	304SS or 316SS	1
2	CASING	304SS or 316SS	1
1	IMPELLER	304SS or 316SS	1

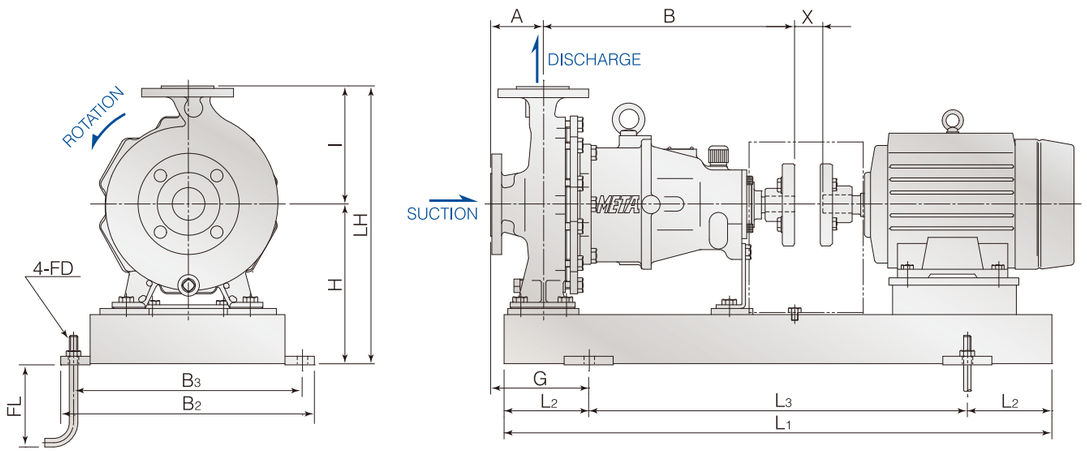
MARK	NAME OF PART	MAT'L	No.REQ'D
20B	MAGNET COUPLING(M)	CAST IRON or STEEL	1
20A	MAGNET COUPLING(P)	304SS or 316SS	1
18	BALL BEARING	SUJ	2
17	OIL GAUGE	RESIN	1
16	SUPPORT	STEEL	1
12	OIL SEAL	NBR	2
11	BEARING COVER	CAST IRON	2
10	BEARING HOUSING	CAST IRON or STEEL	1

MARK	NAME OF PART	MAT'L	No.REQ'D
51	OUTER MAGNET SHAFT	STEEL	1
45	BUSHING	SiC	1+1
35	AIR VENT	RESIN	1
33A	O RING	PTFE	1
33	GASKET	PTFE	1
29	THRUST RING	SiC	1+1

Highly reliable block-building structure

Outline dimension

TYPE MET



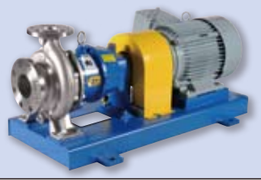
(In the unit of mm)

PUMP SIZE	MOTOR FRAME	PUMP						BASE PLATE								MASS APPROX(kg)	
		A	B	I	H	LH	G	L1	L2	L3	B2	B3	FD	FL	X	BASE	PUMP
40x25–160U	100L , 112M	80	385	150	217	367	150	800	130	540	390	350	M12	160	3	28	48
	132S , 132M	80	385	150	217	367	170	900	150	600	490	440	M16	200	3	43	48
	160M , 160L	80	385	150	272	422	210	1120	190	740	540	490	M16	200	100	59	48
40x25–200U	100L	80	385	180	245	425	150	800	130	540	390	350	M12	160	3	29	53
	112M	80	385	180	245	425	150	800	130	540	390	350	M12	160	3	36	53
	132S , 132M	80	385	180	245	425	170	900	150	600	490	440	M16	200	3	43	53
	160M , 160L	80	385	180	272	452	210	1120	190	740	540	490	M16	200	100	59	53
	180M , 180L	80	385	180	292	472	210	1120	190	740	540	490	M16	200	100	66	53
50x40–160U	100L , 112M	80	385	160	217	377	150	800	130	540	390	350	M12	160	3	28	52
	132S , 132M	80	385	160	217	377	170	900	150	600	490	440	M16	200	3	43	52
	160M , 160L	80	385	160	272	432	210	1120	190	740	540	490	M16	200	100	59	52
	180M	80	385	160	292	452	210	1120	190	740	540	490	M16	200	100	67	52
50x40–200U	112M	80	385	180	245	425	150	800	130	540	390	350	M12	160	3	36	56
	132S , 132M	80	385	180	245	425	170	900	150	600	490	440	M16	200	3	43	56
	160M , 160L	80	385	180	272	452	210	1120	190	740	540	490	M16	200	100	59	56
	180M , 180L	80	385	180	292	472	210	1120	190	740	540	490	M16	200	100	65	56
50x40–250U	80M , 90L	100	401	225	265	490	175	900	150	600	490	440	M16	200	3	43	79
	100L , 112M	100	401	225	265	490	175	900	150	600	490	440	M16	200	3	44	79
	132S , 132M	100	401	225	265	490	175	900	150	600	490	440	M16	200	3	49	79
	160M , 160L	100	401	225	292	517	215	1120	190	740	540	490	M16	200	100	74	79
	180M , 180L	100	401	225	292	517	230	1250	205	840	610	550	M20	250	100	70	79
50x40–250G	180M , 180L	100	500	225	292	517	230	1250	205	840	610	550	M20	250	100	70	94
	200M , 200L	100	500	225	340	565	255	1400	230	940	660	600	M20	250	100	130	94
	225S , 225M	100	500	225	380	605	255	1400	230	940	660	600	M20	250	100	146	94
	250S , 250M	100	500	225	430	655	295	1600	270	1060	730	670	M20	250	100	263	94
80x50–160U	112M	100	385	180	245	425	170	800	130	540	390	350	M12	160	3	36	55
	132S , 132M	100	385	180	245	425	190	900	150	600	490	440	M16	200	3	43	55
	160M , 160L	100	385	180	272	452	230	1120	190	740	540	490	M16	200	100	59	55
	180M , 180L	100	385	180	292	472	230	1120	190	740	540	490	M16	200	100	70	55
80x50–200U	112M	100	401	200	245	445	170	800	130	540	390	350	M12	160	3	35	62
	132S , 132M	100	401	200	245	445	190	900	150	600	490	440	M16	200	3	43	62
	160M , 160L	100	401	200	272	472	230	1120	190	740	540	490	M16	200	100	59	62
	180M , 180L	100	401	200	292	492	245	1250	205	840	610	550	M20	250	100	75	62
80x50–200G	180M , 180L	100	500	200	300	500	245	1250	205	840	610	550	M20	250	100	87	78
	200M , 200L	100	500	200	340	540	270	1400	230	940	660	600	M20	250	100	128	78
	225S , 225M	100	500	200	385	585	270	1400	230	940	660	600	M20	250	100	156	78
	250S , 250M	100	500	200	410	610	310	1600	270	1060	730	670	M20	250	100	261	78

(In the unit of mm)

PUMP SIZE	MOTOR FRAME	PUMP						BASE PLATE								MASS APPROX(kg)	
		A	B	I	H	LH	G	L1	L2	L3	B2	B3	FD	FL	X	BASE	PUMP
80x50–250U	100L ~ 132S	125	401	225	265	490	200	900	150	600	490	440	M16	200	3	46	83
	160M , 160L	125	401	225	292	517	240	1120	190	740	540	490	M16	200	100	69	83
	180M , 180L	125	401	225	292	517	255	1250	205	840	610	550	M20	250	100	78	83
80x50–250G	180M , 180L	125	500	225	292	517	255	1250	205	840	610	550	M20	250	100	80	98
	200M , 200L	125	500	225	340	565	280	1400	230	940	660	600	M20	250	100	130	98
	225S , 225M	125	500	225	380	605	280	1400	230	940	660	600	M20	250	100	148	98
	250S , 250M	125	500	225	430	655	320	1600	270	1060	730	670	M20	250	100	265	98
80x50–315G	160M , 160L	125	500	315	390	705	280	1400	230	940	660	600	M20	250	140	120	160
	180M , 180L	125	500	315	390	705	280	1400	230	940	660	600	M20	250	140	135	160
	200M , 200L	125	500	315	390	705	280	1400	230	940	660	600	M20	250	140	145	160
100x80–160U	90L ~ 132M	100	401	200	245	445	175	900	150	600	490	440	M16	200	3	44	67
	160M , 160L	100	401	200	272	472	215	1120	190	740	540	490	M16	200	100	60	67
	180M , 180L	100	401	200	300	500	230	1250	205	840	610	550	M20	250	100	85	67
100x80–160G	180M , 180L	100	500	200	300	500	230	1250	205	840	610	550	M20	250	100	87	81
	200M , 200L	100	500	200	340	540	255	1400	230	940	660	600	M20	250	100	128	81
	225S , 225M	100	500	200	385	585	255	1400	230	940	660	600	M20	250	100	151	81
	250S , 250M	100	500	200	410	610	295	1600	270	1060	730	670	M20	250	100	261	81
100x80–200U	100L ~ 132M	100	401	225	265	490	175	900	150	600	490	440	M16	200	3	46	69
	160M ~ 180L	100	401	225	292	517	230	1250	205	840	610	550	M20	250	140	79	69
100x80–200G	180M , 180L	100	500	225	320	545	255	1400	230	940	660	600	M20	250	140	121	84
	200M , 200L	100	500	225	340	565	255	1400	230	940	660	600	M20	250	140	137	84
	225S , 225M	100	500	225	380	605	255	1400	230	940	660	600	M20	250	140	153	84
	250S , 250M	100	500	225	430	655	295	1600	270	1060	730	670	M20	250	140	270	84
100x80–250G	160M , 160L	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	120	120
	180M , 180L	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	135	120
	200M , 200L	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	145	120
100x80–250L	180M , 180L	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	135	180
	200M , 200L	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	145	180
	225S , 225M	125	500	280	365	645	265	1400	230	940	660	600	M20	250	140	160	180
	250S , 250M	125	500	280	405	685	305	1600	270	1060	730	670	M20	250	140	240	180
	280S , 280M	125	500	280	450	730	305	1600	270	1060	730	670	M20	250	140	255	180
100x80–315L	160M , 160L	125	500	315	390	705	265	1400	230	940	660	600	M20	250	140	120	225
	180M , 180L	125	500	315	390	705	265	1400	230	940	660	600	M20	250	140	135	225
	200M , 200L	125	500	315	390	705	265	1400	230	940	660	600	M20	250	140	145	225
	225S , 225M	125	500	315	410	725	305	1600	270	1060	730	670	M20	250	140	240	225
	250S , 250M	125	500	315	410	725	305	1600	270	1060	730	670	M20	250	140	280	225
125x100–200G	160M , 160L	125	500	280	340	620	265	1400	230	940	660	600	M20	250	140	120	110
	180M , 180L	125	500	280	340	620	265	1400	230	940	660	600	M20	250	140	135	110
	200M , 200L	125	500	280	340	620	265	1400	230	940	660	600	M20	250	140	145	110
150x125–200G	160M , 160L	140	500	315	390	705	280	1400	230	940	660	600	M20	250	140	120	190
	180M , 180L	140	500	315	390	705	280	1400	230	940	660	600	M20	250	140	135	190
	200M , 200L	140	500	315	390	705	280	1400	230	940	660	600	M20	250	140	145	190
	225S , 225M	140	500	315	410	725	320	1600	270	1060	730	670	M20	250	140	240	190
	250S , 250M	140	500	315	410	725	320	1600	270	1060	730	670	M20	250	140	280	190
150x125–250L	160M , 160L	140	500	355	420	775	280	1400	230	940	660	600	M20	250	140	120	215
	180M , 180L	140	500	355	420	775	280	1400	230	940	660	600	M20	250	140	135	215
	200M , 200L	140	500	355	420	775	280	1400	230	940	660	600	M20	250	140	145	215
	225S , 225M	140	500	355	440	795	320	1600	270	1060	730	670	M20	250	140	240	215
	250S , 250M	140	500	355	440	795	320	1600	270	1060	730	670	M20	250	140	280	215
150x125–315L	160M , 160L	140	500	355	420	775	260	1400	230	940	660	600	M20	250	140	120	250
	180M , 180L	140	500	355	420	775	260	1400	230	940	660	600	M20	250	140	135	250
	200M , 200L	140	500	355	440	795	300	1600	270	1060	730	670	M20	250	140	225	250
	225S , 225M	140	500	355	440	795	300	1600	270	1060	730	670	M20	250	140	240	250
	250S , 250M	140	500	355	440	795	300	1600	270	1060	730	670	M20	250	140	280	250
200x150–250L	180M , 180L	180	500	425	495	920	300	1400	230	940	660	600	M20	250	140	135	300
	200M , 200L	180	500	425	515	940	340	1600	270	1060	730	670	M20	250	140	225	280
	225S , 225M	180	500	425	515	940	340	1600	270	1060	730	670	M20	250	140	240	280
	250S , 250M	180	500	425	515	940	340	1600	270	1060	730	670	M20	250	140	280	280

A Table of Specification for META series

Pump Type	CLOSE COUPLED		OPEN COUPLED	
	MTFO		MET	
Frequency (Hz)	50	60	50	60
Max. total head (m)	80	85	90	130
Max. capacity (ℓ /min)	1600	1200	7000	9000
Max. temperature applicable (℃)	280		450	
Min. temperature applicable (℃)	-80		-100	
Max. liquid specific gravity	2		2	
Max. liquid viscosity (mPa·s,cP)	300		300	
Design pressure (mPaG)	1.0 ~ 1.6 (Depends on pump size)		1.0 ~ 1.6 (Depends on pump size)	
Bore <suction x discharge> (mm)	40x25 ~ 100x80		40x25 ~ 200x150	
Piping connection (Flange standard)	JIS 10K RF		JIS 10K RF	
	ASME 150LB RF		ASME 150LB RF	
Type of impeller	Open type		Close / Open type	
Motor output rating (or Rated motor output)	2.2 ~ 22kW		0.75 ~ 110kW	
(Synchronized) number of revolution (rpm)	1500 / 1800 / 3000 / 3600		1500 / 1800 / 3000 / 3600	
Material for pump body: 304SS	○		○	
Material for pump body: 316SS	○		○	
Material for pump body: ALLOY20	○		○	
Material for pump body: Hastelloy C equivalent	○		○	
Number of pump type	10		18	
Typical type (or model)				

When your requirement exceed the above specification, please consult manufacturer.

The use of monitor is recommended.

The monitor protects the pump from cavitation and dry run.

Pump Protector DRN

Operation

Monitor measures irregular pumping conditions such as dry run, shut off, cavitation or de-couple operation. A built in relay shuts down the motor/pump when power is below the established setting. (Other optional devices are available)

Corrosion resistance table

A:Good B:Fair C:Unsuitable

	Liquid Name	304SS	316SS	Recomendation
A	acetaldehyde	A	A	–
	acetic acid	B	B	HAS.Ceq.
	acetic anhydride	B	A	–
	acetone	A	A	–
	Acetone cyanohydrin	B	B	HAS.Ceq./Ti
	acetyl chloride (25℃)	A	A	–
	acetyl chloride (60℃)	B	A	–
	acrylonitrile	B	B	HAS.Ceq.
	alcohol	A	A	–
	Aluminium hydroxide	A	A	–
	Aluminum acetate	A	A	–
	Aluminum acetate	B	B	HAS.Ceq./Ti
	Alums	A	A	–
	amine	A	A	–
	Ammonia (anhydrous solution)	A	A	HAS.Ceq.
	ammonium bicarbonate	A	A	–
	Ammonium carbonate	A	A	–
	ammonium hydroxide	A	A	–
	ammonium nitrate	B	B	HAS.Ceq./Ti
	Ammonium phosphate, dibasic	A	A	–
	Ammonium sulfate solution	C	B	HAS.Ceq./Ti
	Ammonium sulphate	C	C	HAS.Ceq./Ti
	Amyl acetate	A	A	–
	Anhydrous ammonia	B	B	HAS.Ceq./Ti
	aniline	B	B	HAS.Ceq./Ti
	aniline dye	B	B	HAS.Ceq./Ti
	aniline oil	B	B	HAS.Ceq./Ti
B	Beer	A	A	–
	Benzene (benzol)	A	A	–
	benzene chloride	B	A	–
	benzoic acid	B	B	HAS.Ceq.
	borax	A	A	–
	Boric acid	B	A	–
	butanol	A	A	–
	butyric acid	A	A	–
C	calcium carbonate	A	A	–
	calcium chloride	B	A	–
	calcium sulfate	C	C	HAS.Ceq./Ti
	carbolic acid (phenol)	A	A	–
	carbon dioxide	A	A	–
	carbonic acid	A	A	–
	Carvone (C10H14O)	A	A	–
	caustic soda	B	B	HAS.Ceq.
	cellulose acetate	B	A	–
	chlorinated water	C	C	HAS.Ceq./Ti
	Chlorine (anhydrous solution)	C	C	Ti
	Chlorine ammonium	B	B	HAS.Ceq./Ti
	Chloroform	A	A	–
	chromic acid	B	B	Ti
	citric acid	B	B	HAS.Ceq.
	coal tar	A	A	–
	Copper acetate	A	A	–
	Copper cyanide	A	A	–
	Copper nitrate	B	A	–
	Copper sulfate	C	B	HAS.Ceq.
	cresol	A	A	–
	Crude oil	A	A	–
	cupric nitrate	B	B	HAS.Ceq./Ti
	cuprous chloride	C	C	HAS.Ceq./Ti
	cyclohexane	A	A	–
	Dichlorobenzenes	B	A	–
D	Dichloroethane	A	A	–
	dichromic acid	B	A	–
	diethyl ether	A	A	–
	diethylene glycol	A	A	–
	distilled water	A	A	–
E	ether	A	A	–

	Liquid Name	304SS	316SS	Recomendation
E	ethyl acetate	A	A	–
	ethyl alcohol	A	A	–
	ethyl chloride	C	B	HAS.Ceq./Ti
	ethylene glycol	A	A	–
F	fatty acid	B	A	–
	ferric chloride	C	C	Ti
	Ferric nitrate	B	B	Ti
	ferrous chloride	C	C	Ti
	formaldehyde	B	A	–
	formaline	B	A	–
	formic acid	B	A	–
	Fuel oil	A	A	–
	furfural	A	A	–
G	Gasoline	A	A	–
	glycerine	A	A	–
H	hexanol (higher alcohol)	A	A	–
	hydrazine	A	A	–
	hydrochloric acid	C	C	HAS.Ceq.
	hydrocyanic acid	B	B	HAS.Ceq.
	Hydrofluoric acid	C	C	HAS.Ceq./Ti
	hydrogen chloride gas	C	C	HAS.Ceq./Ti
	hydrogen peroxide	B	B	HAS.Ceq.
	hydrogen sulfide water	C	C	Ti
I	ink	B	A	–
	iodine	C	A	Ti
	iodoform	B	A	Ti
	Iron nitrates	B	B	HAS.Ceq./Ti
	isobutane	B	A	–
K	Kerosene	A	A	–
	kerosene	A	A	–
	ketchup	B	A	–
L	lead acetate	A	A	–
	light oil	A	A	–
	Lubrication oil	A	A	–
M	magnesium carbonate	B	B	Ti
	magnesium chloride, magnesium solution	B	B	Ti
	Magnesium hydroxide	A	A	–
	magnesium sulfate	C	C	HAS.Ceq.
	maleic acid	B	A	–
	manganous chloride	B	B	HAS.Ceq./Ti
	Melanin resin	C	C	HAS.Ceq.
	mercuric chloride	C	C	HAS.Ceq.
	Mercury	A	A	–
	methacrylic acid	C	A	–
	methyl alcohol	A	A	–
	methyl chloride	C	C	HAS.Ceq.
	methyl chloride (dried)	A	A	–
	Monochloroacetic acid	C	C	HAS.Ceq./Ti
N	Naph sulfonic acid	B	B	HAS.Ceq.
	naphtha	A	A	–
	naphthaline	A	A	–
	Naphthenic acid	A	A	–
	nickel chloride	C	A	–
	Nickel nitrate	B	B	HAS.Ceq./Ti
	nickel sulfate	C	C	HAS.Ceq./Ti
	nitric acid	B	A	–
	nitrobenzene	B	A	–
O	oil	A	A	–
	olein acid	A	A	–
	Oleum	C	C	HAS.Ceq./Ti
	organochloride	B	A	–
	Oxydole (Hydrogen peroxide)	B	A	–
P	Palm oil	A	A	–
	paraffin oil	A	A	–
	peptane (liquified)	A	A	–
	phenol	A	A	–
	Phospheric acid solution	C	C	HAS.Ceq.

	Liquid Name	304SS	316SS	Recomendation
P	phosphoric acid	C	C	HAS.Ceq.
	Photo developer	A	A	–
	potassium bichromate	A	A	–
	potassium bromide	B	A	–
	potassium carbonate	B	A	–
	potassium carbonate solution	B	A	–
	potassium chlorate	B	B	Ti
	potassium chloride	B	A	–
	potassium cyanide	B	A	–
	potassium cyanide solution	B	B	HAS.Ceq./Ti
	potassium hydroxide	A	A	–
	potassium nitrate	A	A	–
	Potassium permanganate	B	A	–
	Potassium sulphate	B	A	HAS.Ceq./Ti
	propionic acid	B	B	HAS.Ceq./Ti
	propylene glycol	A	A	–
	propylene oxide	A	A	–
	pyrogallol	B	B	HAS.Ceq./Ti
S	Salt water	B	A	Ti
	Sea water	B	B	Ti
	silver nitrate	B	A	–
	Soapy water	A	A	–
	soda	A	A	–
	Sodium acetate	A	A	–
	sodium bisulfite	B	B	HAS.Ceq./Ti
	Sodium borate	A	A	–
	sodium bromide	A	A	–
	sodium carbonate	B	A	–
	sodium chlorate (40%)	B	B	HAS.Ceq./Ti
	sodium chlorate (70%)	B	B	HAS.Ceq./Ti
	sodium chloride	B	A	–
	sodium cyanide	A	A	–
	sodium fluoride	C	C	HAS.Ceq./Ti
	Sodium Hydrogen Carbonate	A	A	–
	Sodium hydrosulphite	C	C	Ti
	sodium nitrate	A	A	–
	sodium nitrate solution	A	A	–
	sodium perborate	A	A	–
	sodium perchlorate	B	B	HAS.Ceq./Ti
	Sodium perchlorate	B	A	–
	sodium peroxide	B	A	–
	sodium phosphate	B	A	–
	sodium phosphorous acid	C	B	HAS.Ceq./Ti
	Sodium sulfate	C	B	HAS.Ceq.
	sodium sulfate solution	A	A	–
	sodium sulfite	A	A	–
	Sodium sulphide solution	B	A	–
	Sodium sulphides	B	A	–
	soybean oil	A	A	–
	Starch	A	A	–
	Sulfide valve liquid	A	A	–
	sulfite of soda	A	A	–
	sulfonyl chloride	C	B	HAS.Ceq.
	sulfur	C	B	HAS.Ceq.
	sulfur dioxide	C	B	HAS.Ceq./Ti
	sulfuric acid	C	B	HAS.Ceq.
	sulfurous acid	C	B	HAS.Ceq./Ti
T	trichloroethylene	A	A	–
	trichloroethylene	A	A	–
	Triol solution	A	A	–
U	urea	C	C	HAS.Ceq./Ti
V	vinegar	B	A	–
	viridine	A	A	–
W	Whiskey	B	A	–
X	Xylol	A	A	–
Z	zinc chloride	C	C	HAS.Ceq./Ti
	zinc sulfate	C	C	HAS.Ceq.

Yellow highlighted from our supply record.

SANWA PUMP

MANUFACTURER SANWA HYDROTECH CORPORATION

No.2021-10META-E-03(100)AD