SATAKE

SATAKE MULTI MIXERS

S3～S9 Series

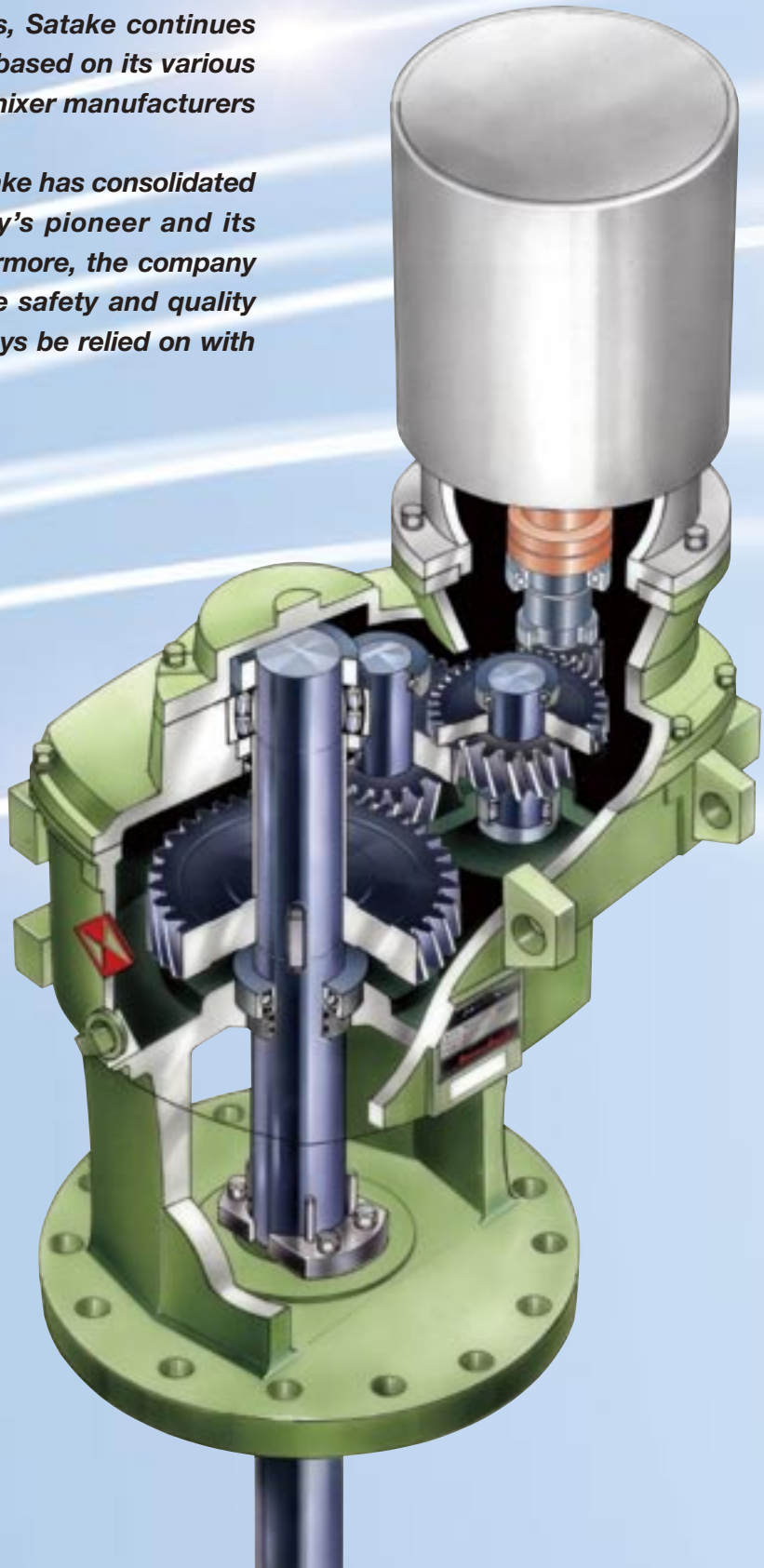
Uncompromising Commitment to Detail

CAT.No M-25E(100)

Technical Excellence and Reliability through Satake's Safety and Quality Control System

Satake has established its present reputation as a prominent manufacturer of high-performance and high-quality mixers through more than 80 years of uncompromising research and development efforts. To continually meet customer demands, Satake continues to develop widely ranging expertise based on its various measuring techniques which other mixer manufacturers cannot offer.

Both domestically and abroad, Satake has consolidated its operation bases as the industry's pioneer and its exports are growing steadily. Furthermore, the company is strictly committed to ensuring the safety and quality of its products so that they can always be relied on with complete confidence by their users.



Satake Multi S Mixers Series

C O N T E N T S

Mixers of the New Century

By making best use of advanced measuring techniques, flow visualizing methods, imaging equipment, laser Doppler Velocity Meters (LDV) and computers, Satake has further upgraded the reliability, functionality and safety of its mixers. The company's mixer series has been newly joined by those which allow for safe and easy removal of mechanical seals in case of need. Satake is pleased to present the latest lineup of its superb new-generation mixers.

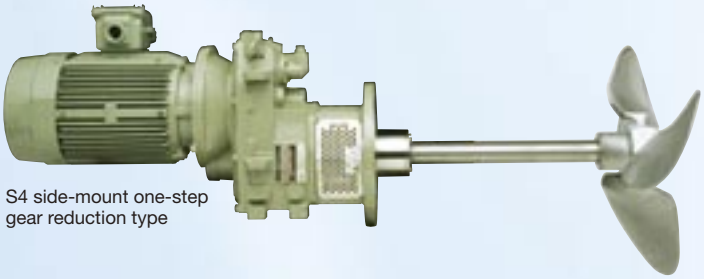
Features

1. ***Mixers are made more compact through the rearrangement of gear arrays.***
2. ***Substantial cost reduction is made possible through the increased use of common parts.***
3. ***The combination of rotation speed and motor output can be set in 17 different steps, a range far greater than that preceding models.***
4. ***The newly developed 3-bladed axial flow, 1-stage impeller achieves high discharge coefficient and low drag coefficient. This simplified impeller provides even higher performance than 4-bladed pitched paddle, 2-stage impellers.***
5. ***These mixers can be used with any type of motor sold on the market.***
6. ***With some of these new mixers, mechanical seals can be easily attached or detached without removing the mixers from their place of installation.***

S5 top-mount mixer with removable mechanical seal system

S5 top-mount two-/three-step gear reduction type

S4 top-mount one-step gear reduction type



S4 side-mount one-step gear reduction type

Consult Us to Select Optimal Models that Meet Your Desi

Model Coding

(Example)

S T 5 4 — G_3 P R — 7.5 L I

Inverter drive

Torque type
L : Low torque
H : High torque
(S8～S9 Series only)

Motor capacity
0.75 to 90 kW
(3.7 to 30kW for side-mount type)

Top-mount flange type
R : Round flange
S : Square flange (option)

Side-mount type
L : Foot mount
H : Hanging mount

Shaft sealing system
P : Gland packing seal
M : Mechanical seal
E : Removable mechanical seal system

Drive system
G : One-step gear reduction
G2 : Two-step gear reduction
(for top-mount type only)
G3 : Three-step gear reduction
(for top-mount type only)

Motor pole number
4 : 4 poles
6 : 6 poles

Multi Mixer Series
5 : S5 series S3～S9 series
(side-mount type available in S3, S4 and S5 series)

Mixer mounting direction
T : Top-mount type
S : Side-mount type

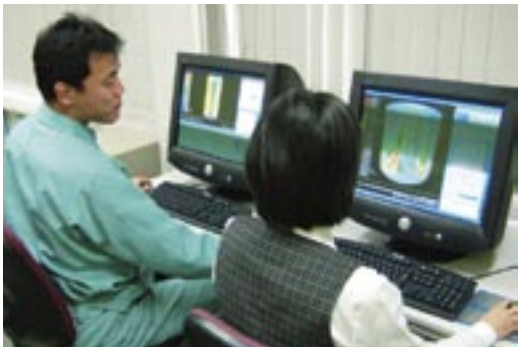
Satake Multi S Mixer
(Standard finish color Munsell 7.5GY6/3)

Safety and Quality Control

Satake's mixers all carry ⚠ labels to indicate that we are actively involved in the comprehensive safety control and quality assurance system with due consideration given to the PL (Product Liability) Law. Our quality assurance system covers the entire process from product development all the way through to the sale and after-sale services. Each independent process of this system is adeptly handled by the sections and departments in charge which have their established quality assurance programs.

Satake's R&D and other sections are staffed by highly skilled and experienced personnel. The company's techniques and expertise based on such human resources are effectively implemented at its plants which are complete with various high-tech equipment and inspection facilities including FMS.

This is why Satake's Multi S Mixers, produced under strict safety and quality control, can always be relied on by their users.



red Applications

Model Variations — Top-mount Type (50 Hz)

		Motor output (kW)															
	Speed (min^{-1})	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
One-step gear reduction	350					S3	S3	S4	S4	S5	S5	S5					
	280					S3	S3	S4	S4	S5	S5	S5					
	230(*)				S3	S3	S4	S4	S5	S5	S5						
	190(*)				S3	S3	S4	S4	S5	S5	S5						
Two-step gear reduction	155			S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	125		S3	S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	100		S3	S3	S4	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	84		S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S7	S8L	S8L	S8H
	68		S3	S3	S4	S5	S5	S5	S6	S6	S6	S7(*)	S7(*)	S8L(*)	S8L(*)	S8H(*)	
	56									S6	S7(*)	S7(*)		S8L(*)	S8H(*)		
Three-step gear reduction	56	S3	S3	S4	S4	S5	S5	S6	S6				S7				
	45	S3	S3	S4	S5	S5	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H
	37	S3	S4	S4	S5	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H	S9H
	30	S3	S4	S4	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H	S9H	
	25	S3	S4	S5	S5	S6	S6	S7	S7	S8L	S8L	S8H	S9L	S9H	S9H		
	20	S4	S4	S5	S5	S6	S6	S7	S7	S8L	S8H	S9L	S9H	S9H			
	16.5(*)	S4	S5	S5	S6	S6	S7	S7	S8L	S8H	S9L	S9H	S9H				
	13.5(*)	S4	S5	S5	S6	S7	S7		S8H	S9L	S9H	S9H					

(*) in the above table indicates 6P motor.

Model Variations — Top-mount Type (60 Hz)

		Motor output (kW)															
	Speed (min^{-1})	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
One-step gear reduction	350					S3	S3	S4	S4	S5	S5	S5					
	280(*)				S3	S3	S4	S4	S5	S5	S5						
	230(*)				S3	S3	S4	S4	S5	S5	S5						
Two-step gear reduction	190			S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	155			S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	125		S3	S3	S3	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	100		S3	S3	S4	S4	S4	S5	S5	S6	S6	S6	S7	S7	S8L	S8L	S8L
	84		S3	S3	S4	S4	S5	S5	S6	S6	S6	S7(*)	S7(*)	S8L(*)	S8L(*)	S8L(*)	
	68									S6	S6	S7(*)	S7(*)	S8L(*)	S8L(*)	S8H(*)	
Three-step gear reduction	68		S3	S3	S4	S5	S5	S5	S6								
	56	S3	S3	S4	S4	S5	S5	S6	S6	S7	S7	S7	S7	S8L	S8H	S9L	S9L
	45	S3	S3	S4	S5	S5	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H
	37	S3	S4	S4	S5	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H	S9H
	30	S3	S4	S4	S5	S6	S6	S7	S7	S7	S8L	S8H	S8H	S9L	S9H	S9H	
	25	S3	S4	S5	S5	S6	S6	S7	S7	S8L	S8L	S8H	S9L	S9H	S9H		
	20(*)	S4	S4	S5	S6	S6	S7	S7	S8L	S8L	S8H	S9L	S9H	S9H			
	16.5(*)	S4	S5	S5	S6	S6	S7	S7	S8L	S8H	S9L	S9H	S9H				

(*) in the above table indicates 6P motor.

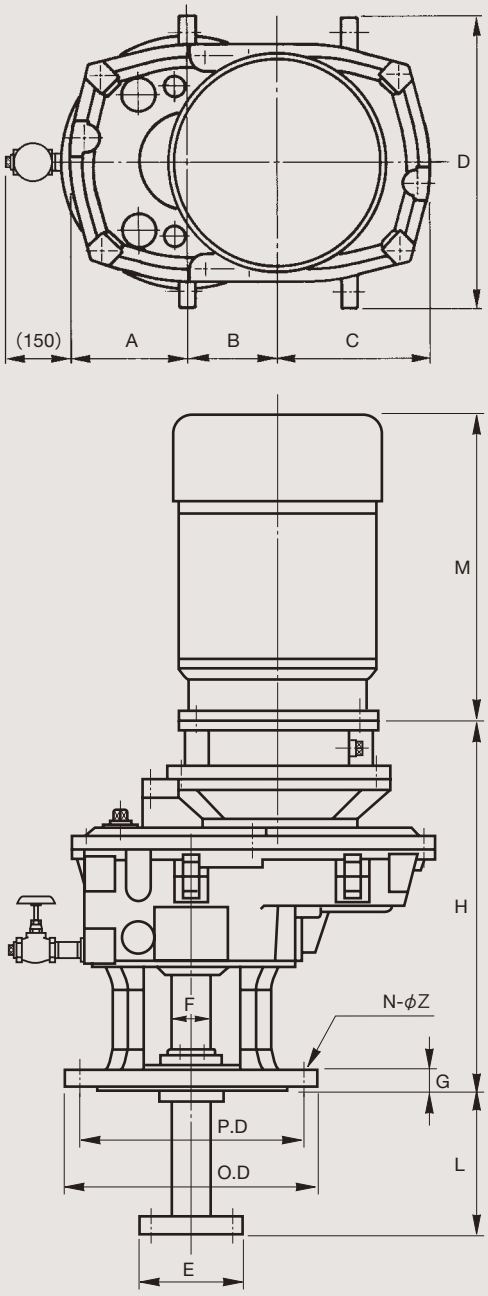
Model Variations — Side-mount Type (50/60 Hz)

			Motor output (kW)							
		Speed (min^{-1})	3.7	5.5	7.5	11	15	18.5	22	30
One-step gear reduction	50Hz	350		S3	S3	S4	S4	S5	S5	S5
		280		S3	S3	S4	S4	S5	S5	S5
		230(*)	S3	S3	S4	S4	S5	S5	S5	
	60Hz	350		S3	S3	S4	S4	S5	S5	S5
		280(*)	S3	S3	S4	S4	S5	S5	S5	
		230(*)	S3	S3	S4	S4	S5	S5	S5	

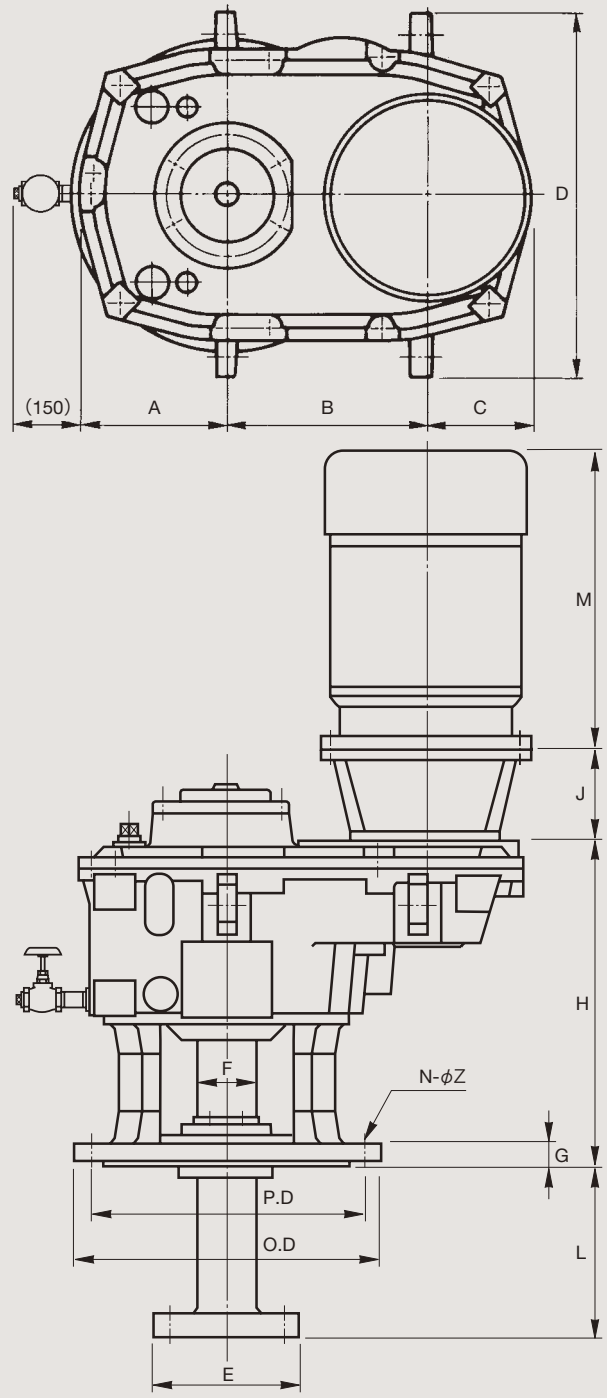
•S3 series: Up to 132MJ base size for motor installation (flange outside diameter: 300).
•S4 series: Up to 160LJ base size for motor installation (flange outside diameter: 350).
•S5 series: Up to 200LJ base size for motor installation (flange outside diameter: 450).
(*) in the above table indicates 6P motor.

Standard Dimensional Drawings — Top-mount Type

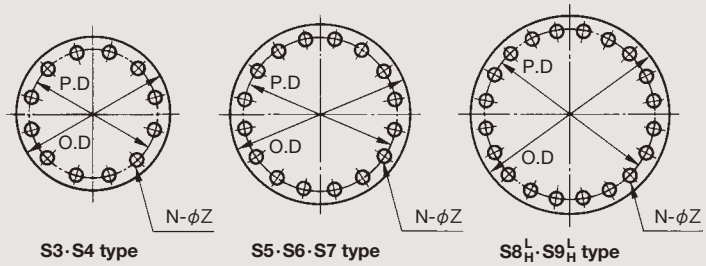
One-step gear reduction



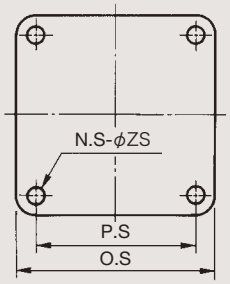
Two-step/three-step gear reduction



Round flange



Square flange (option)



Because Satake makes every effort to improve the quality of its products, the product delivered to you may differ somewhat from the shape or specifications of the product described in this catalog.

Mixers Embody the Needs of Today

Standard Dimensions — Top-mount Type

	Series	Motor output (kW) 4P	Motor output (kW) 6P	Dimensions (mm) O.D	P.D	O.S	P.S	G	N-φZ	N.S	φZS	F	E	L	H	J*	A	B	C*	D	M**	Approximate weight of mixer main unit (kg)** (Motor weight in bracket)	
One-step gear reduction	S3	5.5	3.7	350	310	□350	□305	24	12-23	4	24	55	137	200	510	—	162	119	214	402	400	225	(80)
		7.5	5.5																				
	S4	11	7.5	400	355	□400	□350	26	12-25	4	24	65	157	200	579	—	175	138	216	446	485	315	(110)
		15	11																		525	335	(130)
	S5	18.5	15	445	400	□445	□395	28	16-25	4	26	85	207	250	683	—	208	176	251	522	575	530	(195)
		22																					
		30	18.5																		615	560	(225)
			22																				
Two-step gear reduction • Three-step gear reduction	S3	0.75	—	350	310	□350	□305	24	12-23	4	24	55	137	200	364	—	162	224	109	402	260	150	(17)
		1.5	—																		312	155	(24)
		2.2	—													12			125		328	165	(30)
		3.7	—																		355	180	(48)
	S4	0.75	—	400	355	□400	□350	26	12-25	4	24	65	157	200	391	—	175	239	115	446	260	195	(17)
		1.5	0.75																		312	200	(24)
		2.2	1.5													12			125		328	210	(30)
		3.7	—																		355	225	(48)
		5.5	—													18			150		400	260	(80)
		7.5																					
	S5	2.2	1.5	445	400	□445	□395	28	16-25	4	26	85	207	250	453	12	208	287	141	522	328	315	(30)
		3.7	2.2																		355	330	(48)
		5.5	—													18			150		400	360	(80)
		7.5																					
		11	—																175		485	385	(110)
		15	—																		525	405	(130)
	S6	5.5	3.7	490	445	□490	□435	28	16-25	4	28	105	237	300	553	18	251	346	175	623	400	540	(80)
		7.5	5.5																				
		11	—																		485	560	(110)
		15	—																		525	580	(130)
		18.5	—													205			200		575	700	(195)
		22																					
		30	—																		615	730	(225)
	S7	—	5.5	560	510	□560	□490	30	16-27	4	35	120	275	350	656	18	265	381	180	680	400	810	(80)
		11	7.5																		485	830	(110)
		15	11																		525	850	(130)
		18.5	—													205			200		575	970	(195)
		22																					
		30	22																		615	1,000	(225)
		37	30													260			225		660	1,110	(325)
		45	37																				
	S8L	18.5	15	620	565	—	—	32	20-27	—	—	130	295	350	727	205	290	429	201	762	575	1,310	(195)
		22																					
		30	18.5																		615	1,340	(225)
		37	—													260			225		660	1,450	(325)
		45																					
		55	45																275		685	1,470	(365)
		75	55																		975	1,470	(630)
		90	75																		1,075	1,830	(720)
	S8H	22	15	620	565	—	—	32	20-27	—	—	150	335	350	727	205	290	429	201	762	575	1,400	(195)
		30	18.5																		615	1,430	(225)
			22																				
		37	—													260			225		660	1,540	(325)
		45																					
		55	—																275		685	1,560	(365)
		—	55																		975	1,830	(630)
		90	75																		1,075	1,920	(720)
	S9L	30	18.5	745	680	—	—	34	20-33	—	—	160	347	400	833	217	353	530	208	921	615	2,070	(225)
			22																				
		37	30													241			225		660	2,170	(325)
		45																					
		55	—													276			275		685	2,210	(365)
		75	—																		975	2,480	(630)
		90	—																		1,075	2,570	(720)
	S9H	—	22	745	680	—	—	34	20-33	—	—	180	395	400	833	217	353	530	208	921	615	2,200	(225)
		37	30													241			225		660	2,300	(325)
		45	37																				
		55	45													276			275		685	2,340	(365)
		75	—																		975	2,610	(630)
		90	—																		1,075	2,700	(720)

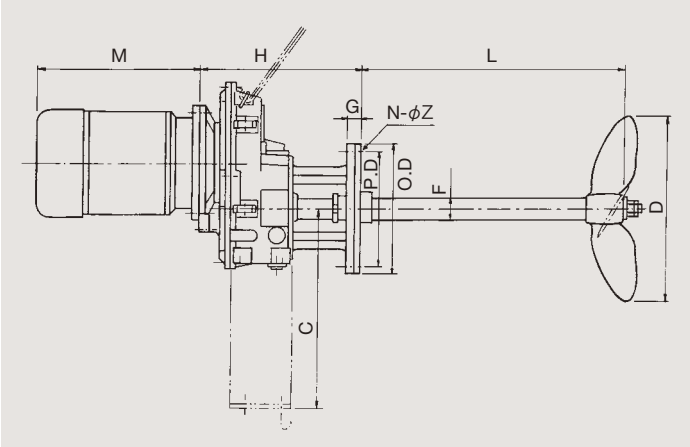
*Dimensions J and C marked with asterisks in the table are based on the totally-enclosed fan-cooled outdoor-type motor made of Yasukawa Electric. Those dimensions may vary in the case of a totally-enclosed safety-increased motor and totally-enclosed flame-proof motor type of 22kw or more. Also those dimensions may vary depending on the motor manufacture.

**Dimension M marked with asterisk and weight of mixer main unit are based on the totally-enclosed fan-cooled outdoor-type motor made of Yasukawa Electric.

Standard Dimensions and Standard Dimensional Drawings — Side-mount Type

	Series	Speed (min^{-1})	Motor output (kW)	No. of polarities	Dimensions (mm)										Approximate weight of mixer main unit (kg)* (Motor weight in bracket)	
					O.D	P.D	N-ϕZ	G	F	L	H	C	M*	D		
One-step gear reduction	S3	350	5.5	4	ϕ350	ϕ310	12-23	47	55	550	533	750	400	500	260	(80)
			7.5	4									400	530	260	(80)
		280	5.5	4									400	530	260	(80)
			7.5	4									400	600	265	(80)
			3.7	6									400	500	260	(80)
			5.5	6									400	530	260	(80)
		230	3.7	6									400	590	265	(80)
			5.5	6									400	650	270	(80)
	S4	350	11	4	ϕ400	ϕ355	12-25	51	65	650	604	890	485	590	360	(110)
			15	4									525	630	385	(130)
		280	11	4									485	650	365	(110)
			15	4									525	680	390	(130)
			7.5	6									485	600	370	(110)
			11	6									525	650	385	(130)
		230	7.5	6									485	680	360	(110)
			11	6									525	740	400	(130)
	S5	350	18.5	4	ϕ445	ϕ400	16-25	53	85	850	708	1,000	575	650	620	(195)
			22	4									575	680	620	(195)
			30	4									615	710	660	(225)
		280	18.5	4									575	710	630	(195)
			22	4									575	740	630	(195)
			30	4									615	790	670	(225)
			15	6									575	680	620	(195)
			18.5	6									615	710	660	(195)
			22	6									615	740	660	(225)
		230	15	6									575	790	640	(195)
			18.5	6									615	830	670	(225)
			22	6									615	860	680	(225)

*Estimated mixer main unit weight and Dimension M are based on the totally-enclosed fan-cooled outdoor motor manufactured by Yasukawa Electric.

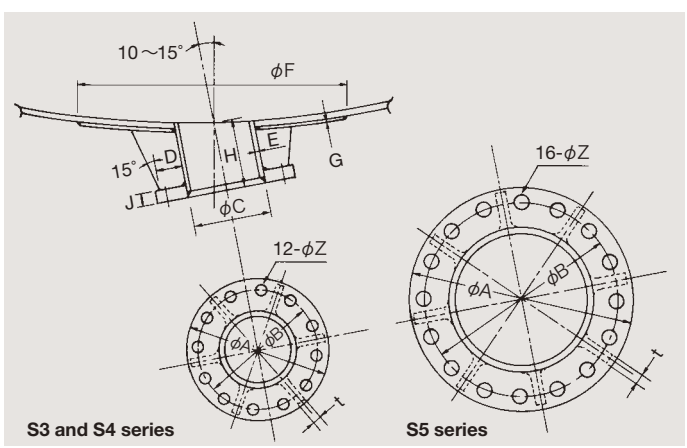


Nozzle Dimensions and Dimensional Drawings for Mounting Side-mount Type

Refer to the table below when mounting a side-mount mixer onto a steel mixing tank. If the tank thickness does not provide sufficient strength, use hanger bars, supports, or other appropriate reinforcements.

(Unit: mm)

Series	Nozzle size	A	B	C	D	E	F	G	H	J	t	Z
S3	225A	350	310	241.8	50	9.0	750	9	120	22	12	23
S4	250A	400	355	267.4	55	9.3	850	9	130	24	12	25
S5	300A	445	400	318.5	55	10.3	950	12	150	24	16	25



S3 and S4 series

S5 series

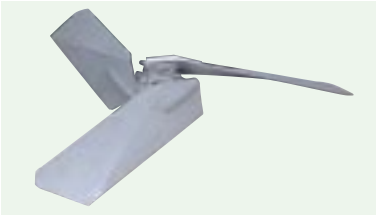
Impellers that Embody Our Commitment to Detail

Impellers play an integral part in the mixing mechanism. Our mixers come with 3-bladed axial flow 1-stage impellers for use, in the low Reynolds number range as well as for general use based on our high-tech measurement research using Laser Doppler Velocity Meter (LDV). By optimally combining the power number (Np value) and discharge coefficient (Nqd value), 1-stage HR320 impellers can provide better performance than 4-bladed pitched paddle, 2-stage impellers.

HR320 Impeller

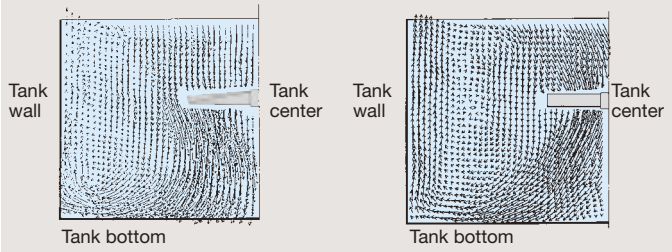
By mounting the mixer off center, the angular advance of the impeller causes the liquid to flow in the axial direction. Also, by slightly changing the bending angles from the root of the blade through the leading edge, flow separation from the rear surface of the blade is minimized and high discharging flow is obtained. The discharging capacity has been improved by more than 70% compared with our conventional 4-bladed pitched paddle, 1-stage impellers, thus achieving energy saving.

•By directly welding the impeller to the mixing shaft instead of key cutting the steel plate welded impeller boss, the impeller and the mixing shaft can be inserted directly into the mixing tank in one unit through the mounting flange. Thus, the mounting process has been simplified. (HR320 HR320S)



Patent pending in Japan and South Korea
Design registered in Japan

Visualized flow pattern near the mixing blade by image processing

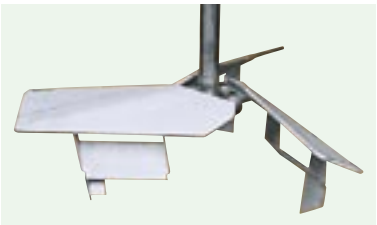


HR320 Impeller **4-bladed pitched paddle**

HR320S Impeller

The impeller's surface pressure control function and large attack angle, combined with its advance blade effect, prevent surface peeling. In addition, the double-blade structure similar to that of the slotted flaps and leading-edge slats of an airplane increases the discharging velocity.

This impeller is especially suited for the mixing of solid and liquid mixtures.



MR205 Impeller

The major pressure gap generated between the positive pressure portion of the main blade and negative pressure portion of the auxiliary blade produces strong discharging flow in the radial direction even with a highly viscous liquid. Also, by installing the impeller with its larger diameter end at the bottom, a strong upward stream can be generated from the tank bottom toward the liquid surface.

It is ideally suited for mixing liquids which differ in their specific gravity and viscosity, as well as for suspension and polymerization of high-density slurries.

Registered utility model in Japan
Patent pending in Japan and Taiwan
Design registered in Japan

AF100 Impeller (Side-mount Type)

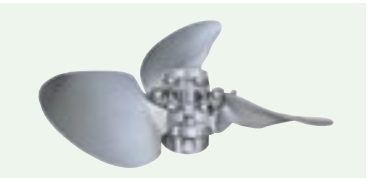
AF100 features an air-foil cross section obtained after a series of studies and experiments aimed at improvement of the blade discharge performance. It features a flat blade with a skewback, designed to minimized impact fluctuation due to inherent cavitation. This impeller reduces the impact fluctuation during rotation, to dramatically increase the discharge efficiency.

This makes the AF100 an ideal choice for side-mount mixers.

•Stainless steel casting.

•Integral casting (up to 680mm blade diameter) and assembled version (for blade diameters over 700mm).

Integral cast type



Assembled type

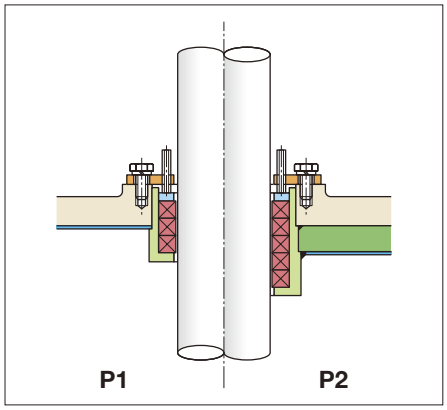
Impeller Performance Comparison

Impeller type	Ratio of power number	Ratio of flow number coefficient	Ratio of flow number per power unit	Ratio of required power per unit flow number	Ratio of maximum discharge flow velocity to blade tip peripheral speed
	Np [ratio]	Nqd [ratio]	$Nqd/Np^{1/3}$ [ratio]	Np/Nqd^{3} [ratio]	Vmax/Vtip [ratio]
4-bladed pitched paddle	Baseline value = 1	Baseline value = 1	Baseline value = 1	Baseline value = 1	Baseline value = 1
HR320 Impeller	0.38	0.98	1.35	0.40	0.77
HR320S Impeller	0.47	0.95	1.22	0.55	0.91

•The above performance figures are relative values, calculated by giving a baseline value of "1" to the performance levels of 4-bladed pitched paddle.

Shaft Sealing System Variations

Shaft Sealing Systems — Top-mount Type



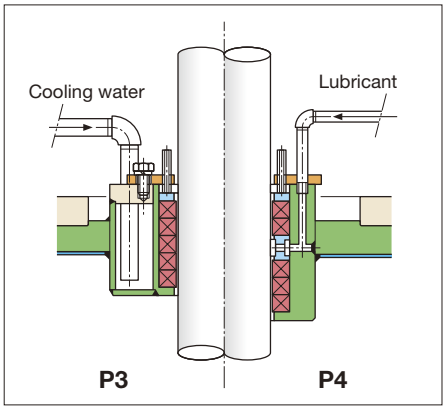
Gland packing seal

P1 type

- Tank temperature: 120°C or less
- Tank pressure: Atmosphere
- This system is not pressure tight. It is suitable for simple sealing.

P2 type

- Tank temperature: 120°C or less
- Tank pressure: 3×10^{-2}MPaG ($0.3kgf/cm^2G$) or less
- Suited for use under low tank pressures.



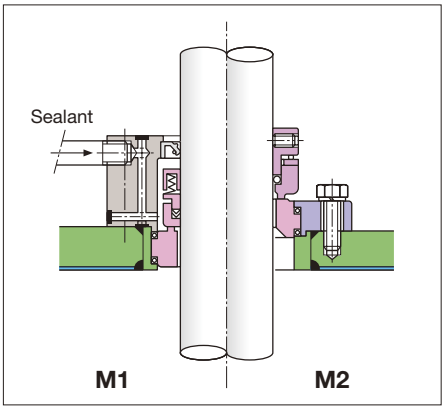
Gland packing seal

P3 type

- Tank temperature: Between 121°C and 170°C
- Tank pressure: 3×10^{-2}MPaG ($0.3kgf/cm^2G$) or less
- Suited for use under the tank temperature of 121°C or more

P4 type

- Tank temperature: 100°C or less
- Tank pressure: 0.1MPaG ($1.0kgf/cm^2G$) or less
- Inject the lubricant periodically through the middle portion of the gland packing. The packing at the rear end of the lantern ring seals off the flow leakage while the packing at the front end seals off the lubricant.



Single mechanical seal

(For use in vacuum type mixing tanks)

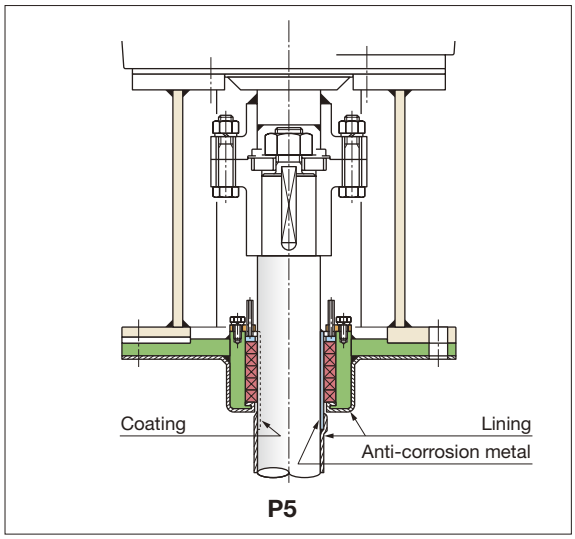
M1 type

- Tank temperature: 100°C or less
- Tank pressure: F.V～3×10^{-2}MPaG ($0.3kgf/cm^2G$) or less
- Generally used in vacuum type mixing tanks where leakage must be avoided. Provides excellent sealing.

Dry mechanical seal

M2 type

- Tank temperature: 150°C or less
- Tank pressure: F.V～0.19MPaG ($1.9kgf/cm^2G$) or less
- Does not require the use of any sealant and thereby is ideal when the mixture or reaction between the sealant and the tank gas or liquid must be avoided.

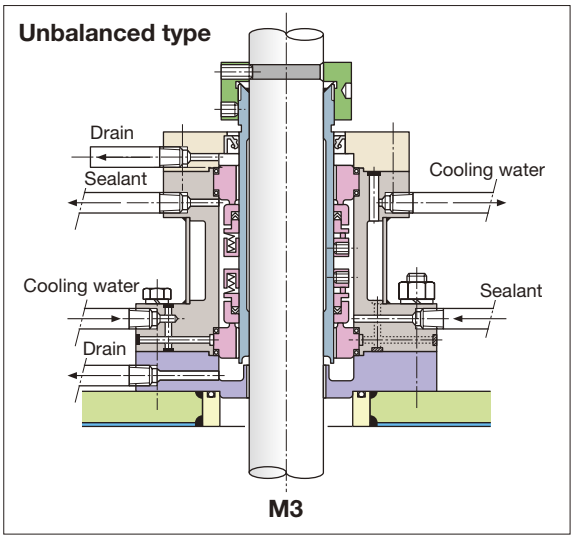


Gland packing seal

(The surfaces exposed to gas or liquid are either lined or coated)

P5 type

- Tank temperature: 100°C or less
- Tank pressure: 3×10^{-2}MPaG ($0.3kgf/cm^2G$) or less
- Various metal lining and coatings (hastelloy, stellite, colmonoy, hard chrome plating, ceramic) are applied on the sliding surface of the gland packing.



Double mechanical seal

M3 type

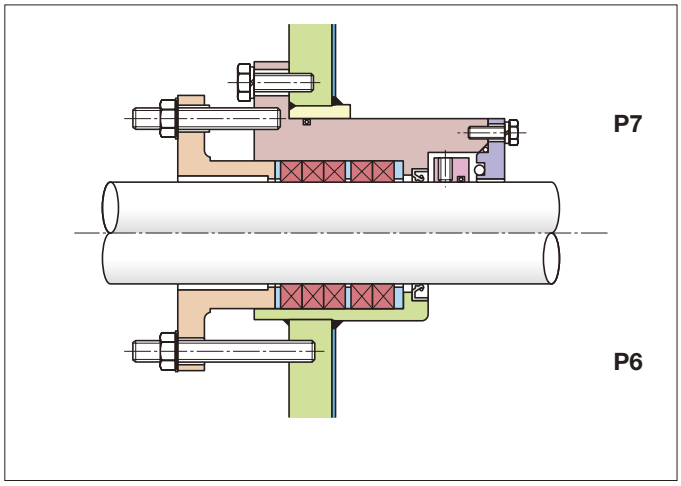
(Unbalanced type)

- Tank temperature: 300°C or less
- Tank pressure: F.V～0.8MPaG ($8.0kgf/cm^2G$) or less

(Balanced type)

- Tank temperature: 300°C or less
- Tank pressure: F.V～2MPaG ($20kgf/cm^2G$) or more
- Generally used in an environment where leakage must be avoided. Provides excellent sealing under high/low temperature, high pressure and vacuum conditions.

Shaft Sealing Systems — Side-mount Type



Gland packing seal (provisional seal)

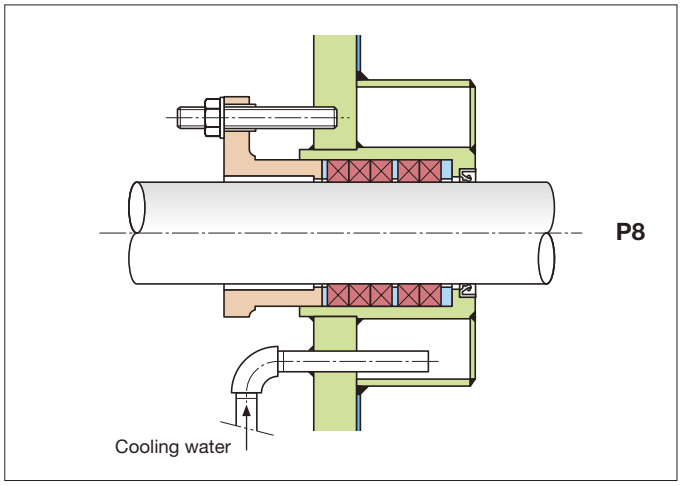
P7 type

- Tank temperature: 100°C or less
- Tank pressure: 0.1MPaG (1.0kgf/cm^{2}G) or less
- Gland packing can be replaced while tank is full.

Gland packing seal (Standard)

P6 type

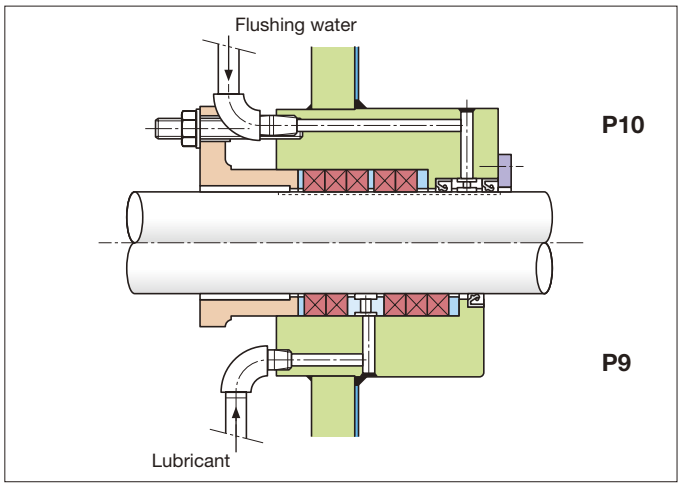
- Tank temperature: 100°C or less
- Tank pressure: 0.1MPaG (1.0kgf/cm^{2}G) or less



Gland packing seal (forced cooling)

P8 type

- Tank temperature: Between 100°C and 170°C
- Tank pressure: 0.1MPaG (1.0kgf/cm^{2}G) or less
- Cooling water introduced in jacket for tank temperatures over 100°C.



Gland packing seal (for slurry applications)

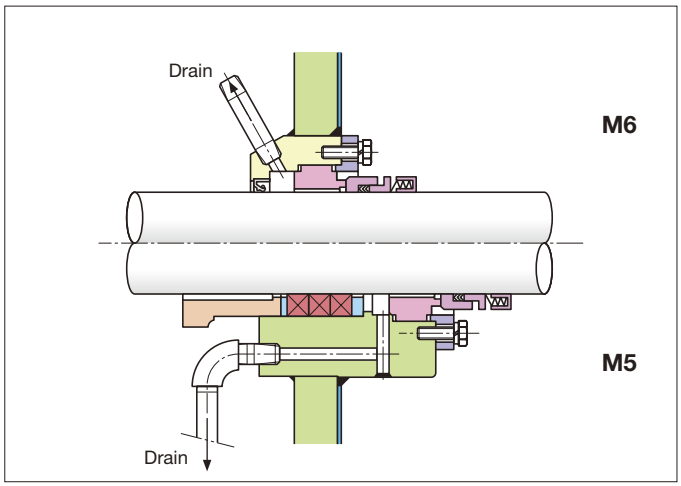
P10 type

- Tank temperature: 100°C or less
- Tank pressure: 0.1MPaG (1.0kgf/cm^{2}G) or less
- The shaft surface at the seal is hardened and flushing water is introduced (2 to 3 liters/min) to prevent slurry from entering the seal.

Gland packing seal

P9 type

- Tank temperature: 100°C or less
- Tank pressure: 0.1MPaG (1.0kgf/cm^{2}G) or less
- Inject the lubricant periodically through the middle portion of the gland packing. The packing at the rear end of the lantern ring seals off the flow leakage while the packing at the front end seals off the lubricant.



Single mechanical seal

M6 type

- Tank temperature: 100°C or less
- Tank pressure: 0.3MPaG (3.0kgf/cm^{2}G) or less
- Generally use where leakage must be avoided. Provides excellent sealing.

Single mechanical seal + Gland packing

M5 type

- Tank temperature: 100°C or less
- Tank pressure: 0.3MPaG (3.0kgf/cm^{2}G) or less
- If the mechanical seal fails, the gland packing is retightened to seal the tank contents.

For single mechanical seal, provisional seal type is available.

Easy Replacement of Mechanical Seal Is the Feature We

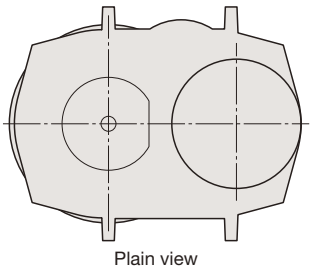
Easily Replaceable Mechanical Seals

1. You can easily replace mechanical seals without removing the reduction parts of the mixers even when they are installed under the low ceiling.
2. Reduction parts can be swung to the side so that the mechanical seal unit can be pulled off upward without any interference.
3. Due to the substantial reduction in maintenance time, prolonged stoppage of the operation can be avoided, thus contributing to a higher operation rate.
4. A winch complete with a simple support is optionally available for pulling up and removing the mechanical seal unit.
5. The mechanical seal unit can be removed for safe disassembly, repair, reassembly and leak test at a location away from the operation site.
6. We also offer simplified mixers with a removable mechanical seal system that are not equipped with a gear reduction rotation mechanism (Fig. 3). For these models, a winch or other device installed at the mixer installation site can be used to remove the gear reduction unit. (Other mechanisms are identical to those of standard models.)

Advantages of the Mechanical Seal

The mechanical seal system is generally used in an environment where leakage must be avoided. It provides excellent sealing performance even under high temperature and high pressure conditions.

1. Virtually no leakage (3ml/h or less).
2. The end face contact reduces the sliding area, thereby minimizing friction loss and power consumption.
3. No damage to the drive shaft.
4. Can be used under high PV value conditions.
   (Unbalanced type: 0.99MPaG, Balanced type: 1MPaG)
5. Can withstand continual operation over 1 to 2 years.
6. By employing the cooling device, it can be used in high temperature liquids (up to +300°C). It can also withstand use in low temperature liquids (-50°C).
7. Retightening and torque adjustment is not necessary.



1. Preparation

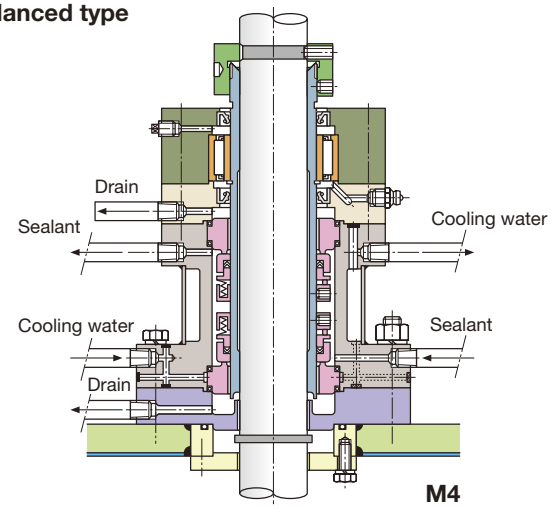
- Set the tank pressure to normal. (Dangerous gases must be displace inside container.)
- Mount the set plate 1) to the mechanical seal sleeve.
- Loosen the sleeve set collar 2).
- Loosen the rigid coupling connecting bolt 3).
- Loosen the adapter frame connecting bolt 4).

2. Pulling up

- Fasten the tap for push up bolt 5) into the adapter frame.
- Fasten the bolt at the swivel bottom 6) and the tap for push up bolt 5) alternately.
- The frame portion and the reduction gear unit are separated.

Are Proud of

Unbalanced type



M4

Double mechanical seal (Built-in bearing)

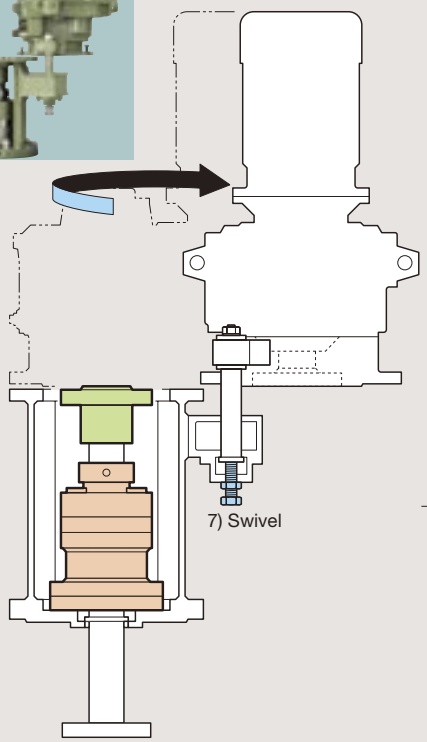
M4 type

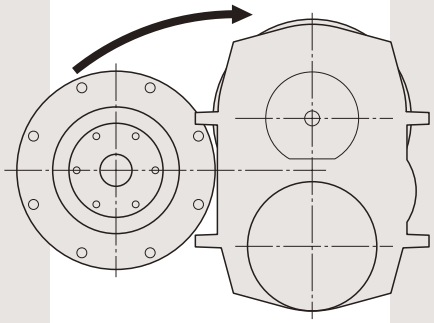
(Unbalanced type)

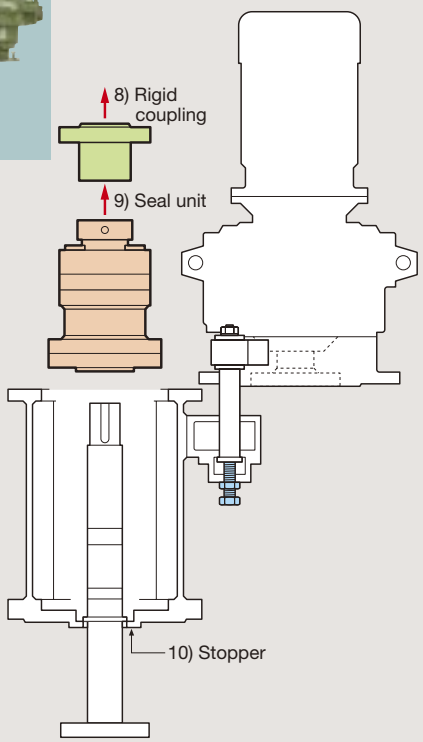
- Tank temperature: 300°C or less
- Tank pressure: F.V～0.99MPaG (9.9kgf/cm^{2}G) or less

(Balanced type)

- Tank temperature: 300°C or less
- Tank pressure: F.V～1MPaG (10kgf/cm^{2}G) or less
- Generally used in an environment where leakage must be avoided. Provides excellent sealing under high/low temperature, high pressure and vacuum conditions. With the built-in bearing, the shaft deflection of the mechanical seal sliding surface is minimized, contributing to higher sealing performance.







3. Rotation

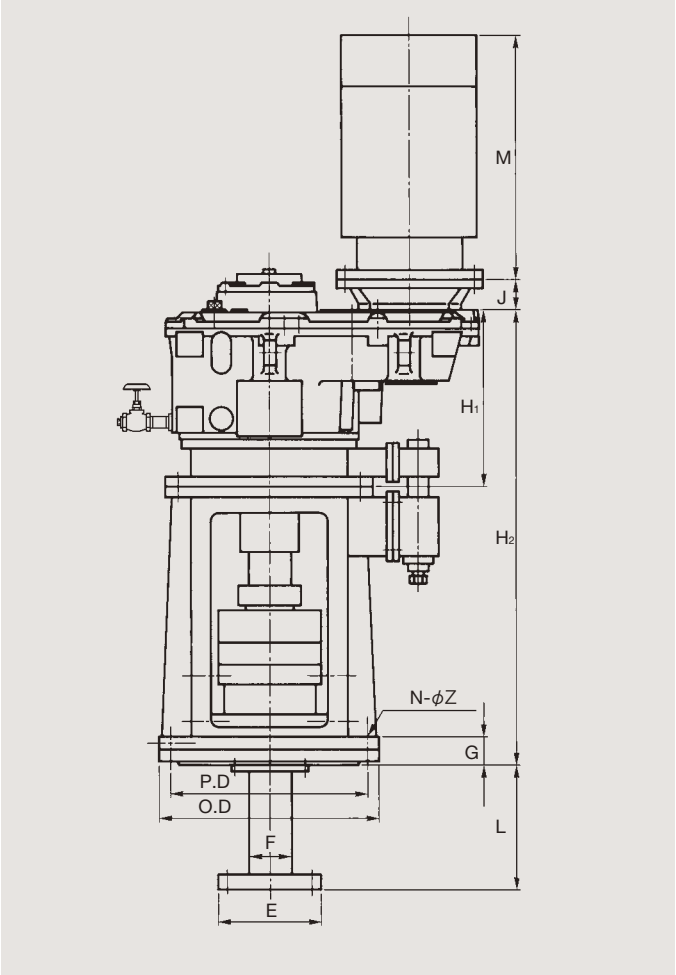
- Use the swivel 7) as a supporting point to rotate the reduction gear unit slowly by hand.

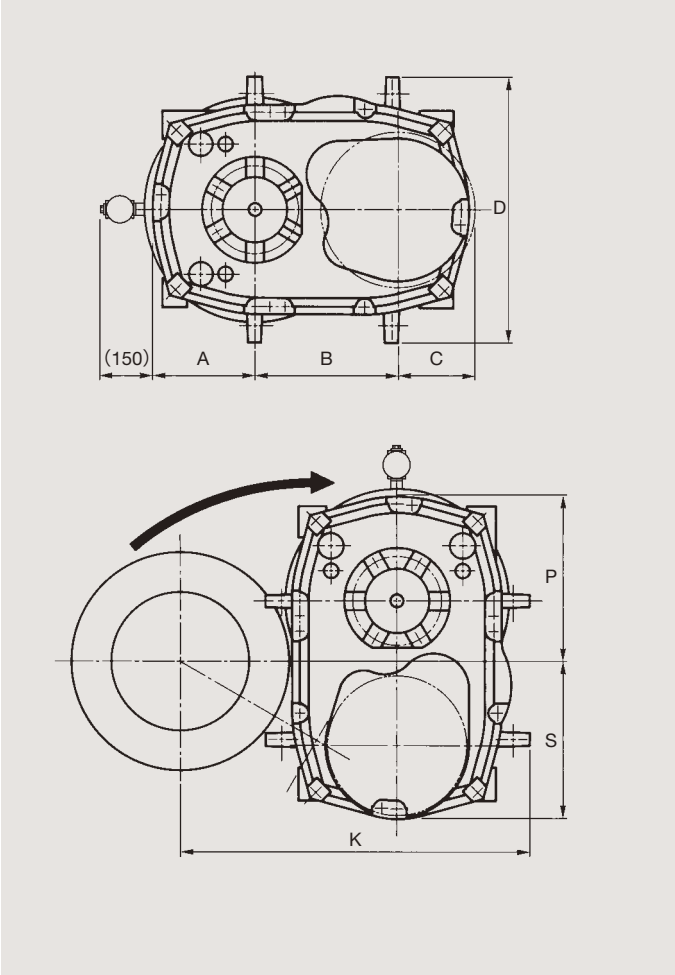
4. Removal

- Remove the rigid coupling 8) in the upward direction.
- Remove the seal unit 9) in the upward direction while keeping the drive shaft on the stopper at the flange bottom.

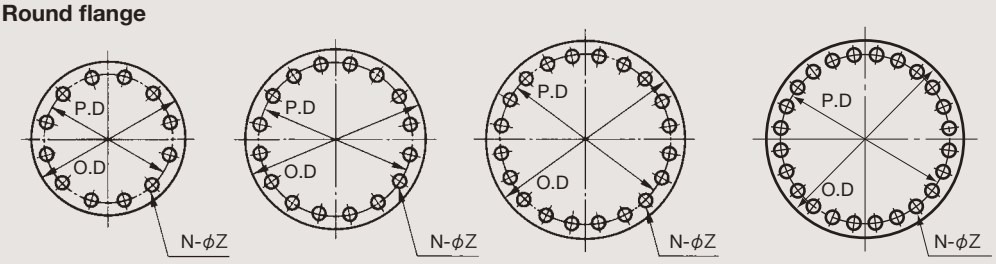
*A provisional seal system is available by option in which the provisional seal is activated to replace the seal without changing the inner tank pressure.

Standard Dimensional Drawings for Removable Mechanical Seal — Top-mount Type





Round flange



Because Satake makes every effort to improve the quality of its products, the product delivered to you may differ somewhat from the shape or specifications of the product described in this catalog.

Standard Dimensions for Removable Mechanical Seal — Top-mount Type

	Series	Motor output (kW)		Dimensions (mm)																		Approximate weight of mixer main unit (kg)** (Motor weight in bracket)	
		4P	6P	O.D	P.D	G	N-ϕZ	F	E	L	H_1	H_2	J*	A	B	C*	D	K	P	S*	M**		
One-step gear reduction	S3	5.5 7.5	3.7 5.5	350	310	59	12-23	55	137	200	418	827	—	162	119	214	402	467	233	262	400	350	(80)
	S4	11	7.5	400	355	61	12-25	65	157	200	517	958	—	175	138	216	446	530	257	272	485	470	(110)
		15	11																		525	470	(130)
	S5	18.5 22	15	445	400	61	16-25	85	207	250	619	1,115	—	208	176	251	522	607	301	335	575	750	(195)
		30	18.5 22																		615	780	(225)
Two-step gear reduction • Three-step gear reduction	S3	0.75	—	350	310	59	12-23	55	137	200	272	681	—	162	224	109	402	467	233	262	260	280	(17)
		1.5	—																		312	285	(24)
		2.2	—										12			125				278	328	290	(30)
		3.7	—																		355	320	(48)
	S4	0.75	—	400	355	61	12-25	65	157	200	329	770	—	175	239	115	446	530	257	272	260	350	(17)
		1.5	0.75																		312	355	(24)
		2.2	1.5										12			125				282	328	365	(30)
		3.7	—																		355	380	(48)
		5.5 7.5	—										18			150				307	400	415	(80)
	S5	2.2	1.5	445	400	61	16-25	85	207	250	389	885	12	208	287	141	522	607	301	335	328	530	(30)
		3.7	2.2																		355	550	(48)
		5.5 7.5	—										18			150				344	400	580	(80)
		11	—													175				369	485	600	(110)
		15	—																		525	630	(130)
	S6	5.5	3.7	560	510	71	16-27	105	237	300	480	1,076	18	251	346	175	623	721	361	411	400	920	(80)
		7.5	5.5																		400	920	(80)
		11	—																		485	940	(110)
		15	—																		525	960	(130)
		18.5 22	—										205			200				436	575	1,080	(195)
		30	—																		615	1,100	(225)
	S7	—	5.5	620	565	73	20-27	120	275	350	560	1,183	18	265	381	180	680	814	392	434	400	1,230	(80)
		11	7.5																		485	1,260	(110)
		15	11																		525	1,280	(130)
		18.5 22	—										205			200				454	575	1,390	(195)
		30	22																		615	1,420	(225)
		37 45	30 37										260			225				479	660	1,540	(325)
	S8L	18.5 22	15	745	680	75	20-33	130	295	350	649	1,309	205	290	429	201	762	959	445	475	575	1,980	(195)
		30	18.5																		615	2,010	(225)
		37 45	—										260			225				499	660	2,130	(325)
		55	45													275				549	685	2,140	(365)
		75	55																		975	2,410	(630)
		90	75																		1,075	2,500	(720)
	S8H	22	15	745	680	75	20-33	150	335	350	649	1,369	205	290	429	201	762	959	445	475	575	2,120	(195)
		30	18.5 22																		615	2,150	(225)
		37 45	—										260			225				499	660	2,260	(325)
		55	—													275				549	685	2,280	(365)
		—	55																		975	2,550	(630)
		90	75																		1,075	2,640	(720)
	S9L	30	18.5 22	845	780	82	24-33	160	347	400	767	1,524	217	353	530	208	921	1,103	525	566	615	3,110	(225)
		37 45	30										241			225				583	660	3,210	(325)
		55	—																		685	3,260	(365)
		75	—										276			275				633	975	3,530	(630)
		90	—																		1,075	3,620	(720)
	S9H	—	22	845	780	82	24-33	180	395	400	767	1,604	217	353	530	208	921	1,103	525	566	615	3,330	(225)
		37 45	30 37										241			225				583	660	3,450	(325)
		55	45																		685	3,490	(365)
		75	—										276			275				633	975	3,760	(630)
		90	—																		1,075	3,850	(720)

*Dimensions J, C and S marked with asterisks in the table are based on the totally-enclosed fan-cooled outdoor-type motor made of Yasukawa Electric. Those dimensions may vary in the case of a totally-enclosed safety-increased motor type of 22kw or more. Also those dimensions may vary depending on the motor manufacture.

**Dimension M marked with asterisk and weight of mixer main unit are based on the totally-enclosed fan-cooled outdoor-type motor made of Yasukawa Electric.

Making every effort to develop and manufacture products that satisfy customer needs and the demand for safety.

SATAKE

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