



PILLARS OF INDUSTRY

Toyo's Breakthrough Line Shaft Series

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HARNESS THE ADVANTAGES

Toyo Line-Shaft customers can harness the advantages of almost any of our Toyo wet ends on a choice of either of our two breakthrough Line-shaft drive configurations. The wet end choices are identical between the two drive configurations which means our line shafts share similar curves.

This special feature of many Toyo products is the backbone of our Toyo Modular Program which allows our customers to maximize the return on their overall investment and reduces critical parts stocking costs to an absolute minimum.

The Toyo Line-Shaft product range is divided into two drive configurations; the 'O' series which features a non-sealed column with a submerged, clear water flushed, split radial bearing and our Toyo Standard series which features double sealed columns which are oil lubricated from the top.

The Toyo 'O' Series: DEVO, DVO, DBVO

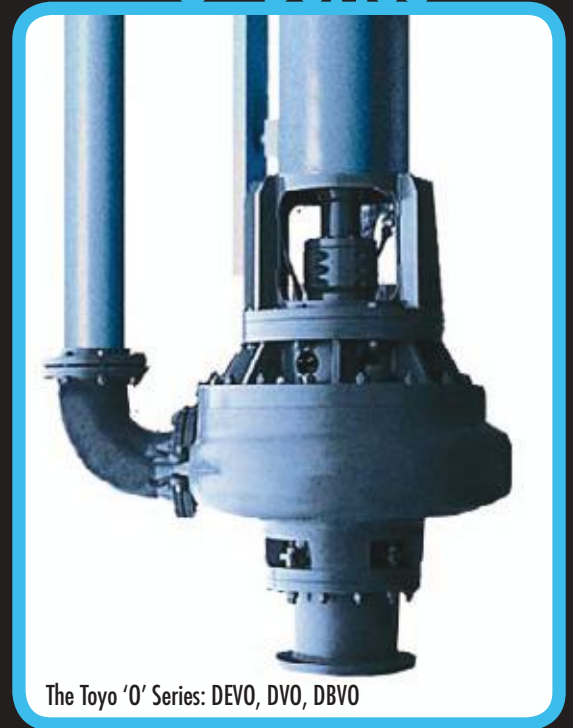
The Toyo 'O' series of Line-Shaft (DEVO, DVO and DBVO) features a non-sealed column with a submerged, clear water flushed, split radial bearing. This breakthrough bearing design uses water flushing to expel solids and lubricate the bearing.

The combination of the split radial bearing with open column design is a maintenance dream come true as it allows you to disassemble and replace the bearing without disassembling the whole pump. These Line-shafts can reach lengths of up to 24 ft max. Customers of the 'O' series of Line Shafts can choose to equip this pump with either a recessed impeller (DEVO), heavy duty closed impeller for heavy solid handling (DBVO) or closed or semi-open impeller with agitator option (DVO).

The Toyo Standard Series: DEV, DV, DBV

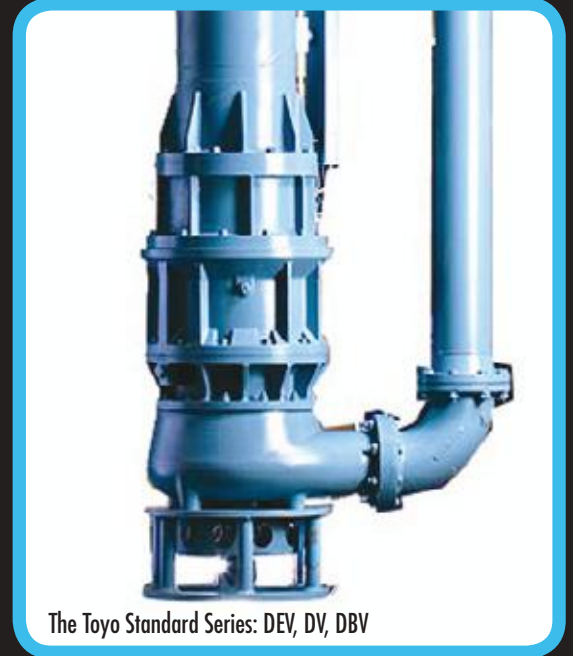
The DEV, DV, DBV Line shafts feature double sealed columns which are oil lubricated from the top. Radial bearings are grease lubricated from the top. There is also a moisture sensor between the primary and secondary seals in the oil chamber. These Line Shafts can reach lengths of up to 50ft max. Customers can choose to equip this pump with either a recessed impeller (DEV), heavy duty closed impeller for heavy solid handling (DBV) or closed or semi-open impeller (DV).

'O' Series



The Toyo 'O' Series: DEVO, DVO, DBVO

Standard Series



The Toyo Standard Series: DEV, DV, DBV

Toyo's Breakthrough Line Shaft series



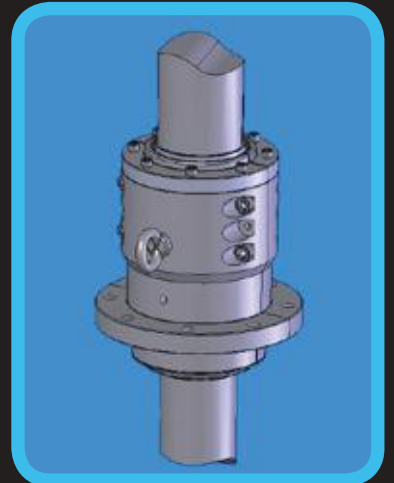
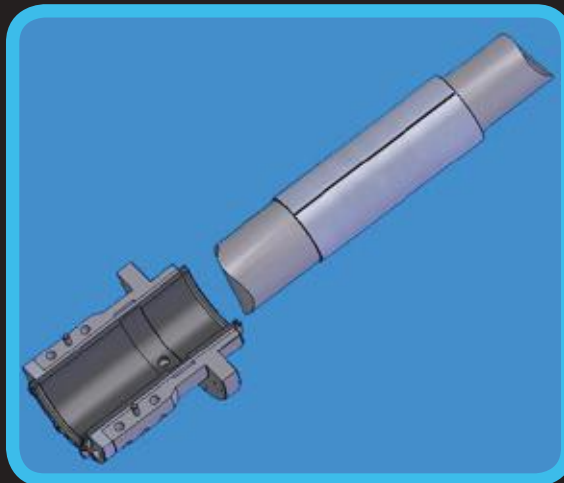
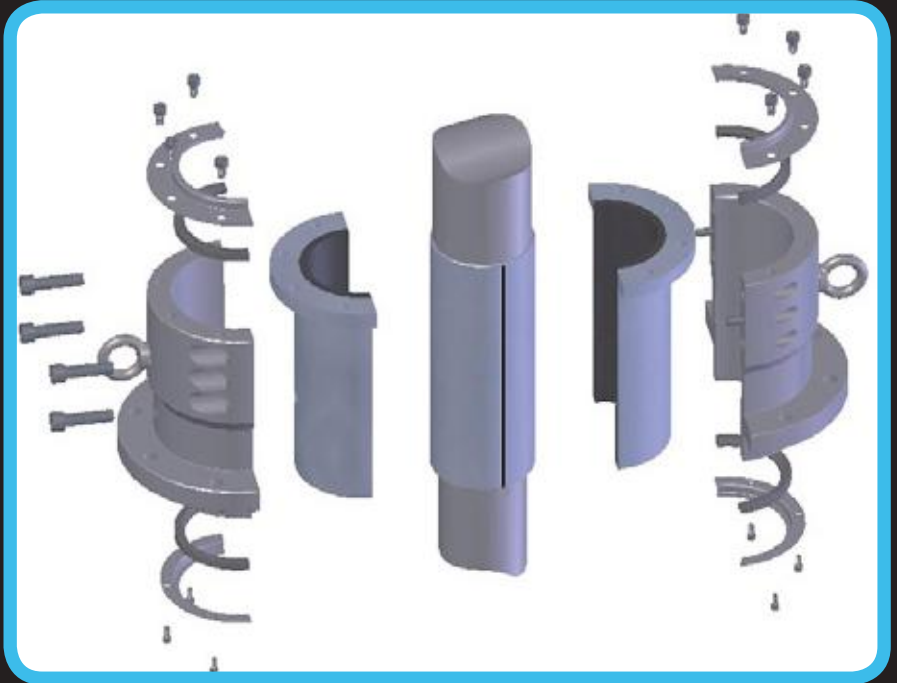
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THE 'O' SERIES WATER CUTLASS BEARING

A Maintenance Dream

Thanks to a non-sealed column and split radial bearing, the entire bearing assembly for the 'O' Series Line-Shaft can be taken apart and replaced **WITHOUT** disassembling the pump. If necessary, this simple procedure uses standard tools and will cause less disruption and downtime than the alternative.

The 'O' series water cutlass bearing is a submerged, clear water flushed, split radial bearing. This breakthrough bearing design uses water flushing to expel solids and lubricate the bearing.



Toyo's Breakthrough Line Shaft series

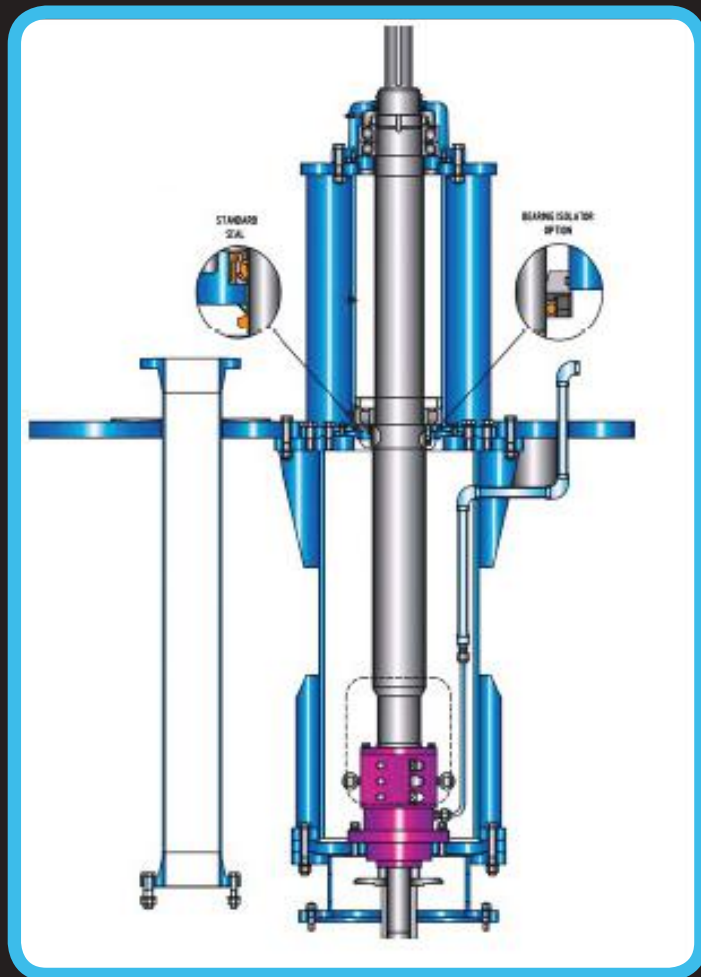
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TOYO LINE SHAFT ADVANTAGES

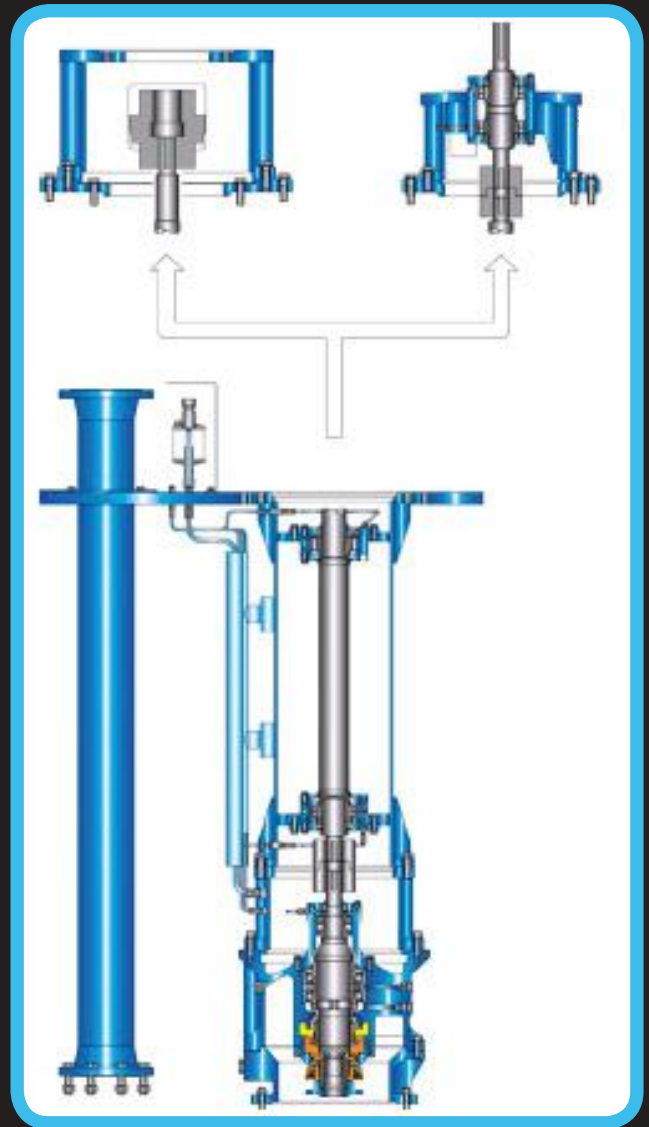
'O' Series (DBVO, DEVO, DVO)

- V-Belt or Direct Drive Available
- Non-sealed Column
- Submerged, clear water flushed, split radial bearings (for ease of service)
- Single volute discharge delivers increased reliability against deflection
- Toyo doesn't rely on unreliable dual volutes to balance hydraulic loads
- Low operational RPMs
- Max 24 ft (16ft with only 1 bearing)



Standard Series (DBV, DEV, DV)

- V-Belt or Direct Drive Available
- Double sealed column, oil lubricated from the top
- Radial bearings, grease lubricated from the top
- Moisture sensor between primary and secondary seals in oil chamber
- Maximum 50 ft lengths



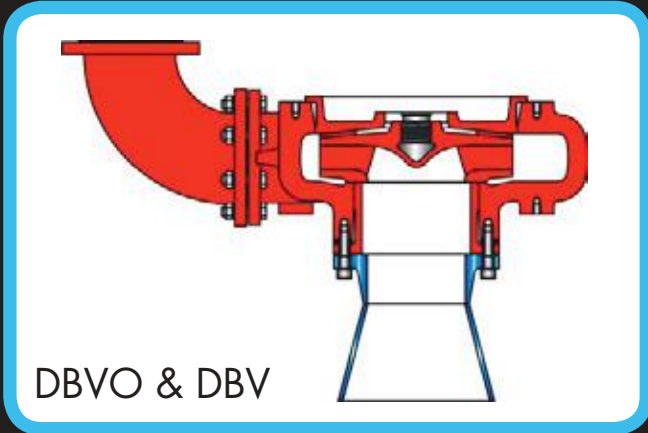
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TOYO WET ENDS

The Toyo Modular Program allows any of these wet ends to be fit onto either Line Shaft drive configuration.

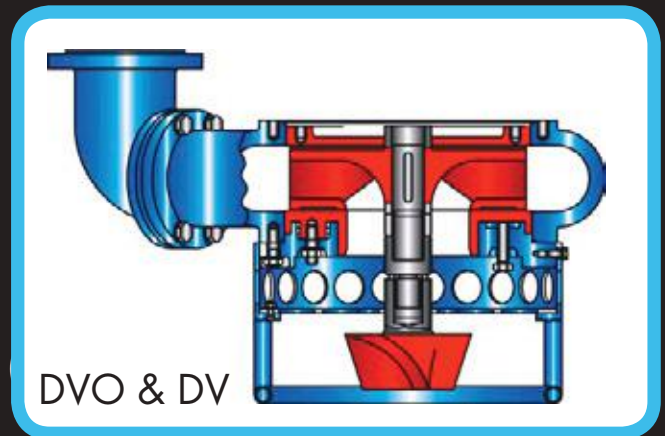


DBVO and DBV

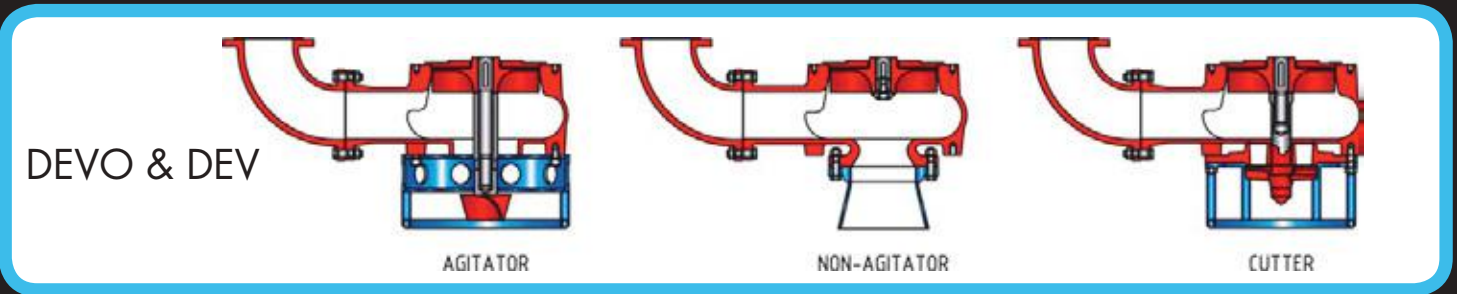
- Heavy solid handling capability
- Closed impeller
- Heavy metal sections for longer wear life
- Increased efficiencies in state of the art slurry pump design
- Wet end also available in horizontal form (DBH)

DVO and DV

- Heavy solid handling capability
- Closed and semi-open impellers available
- Patented Agitator Option
- Heavy metal sections for longer wear life
- Wet end also available in submersible form and vertical cantilever (DC)



DVO & DV



DEVO & DEV

AGITATOR

NON-AGITATOR

CUTTER

DEVO and DEV

- Spiral casing design for increased efficiency and reduced wear
- Fully recessed impeller allows for large solids passage
- Only approx 15% of pumped liquid is in contact with impeller
- Wet end standard in High Chrome and CD4
- Patented Agitator and Chopper options available
- Wet end also available in submersible form (DEM), vertical cantilever (DEC) and horizontal (DEH)

Toyo's Breakthrough Line Shaft series

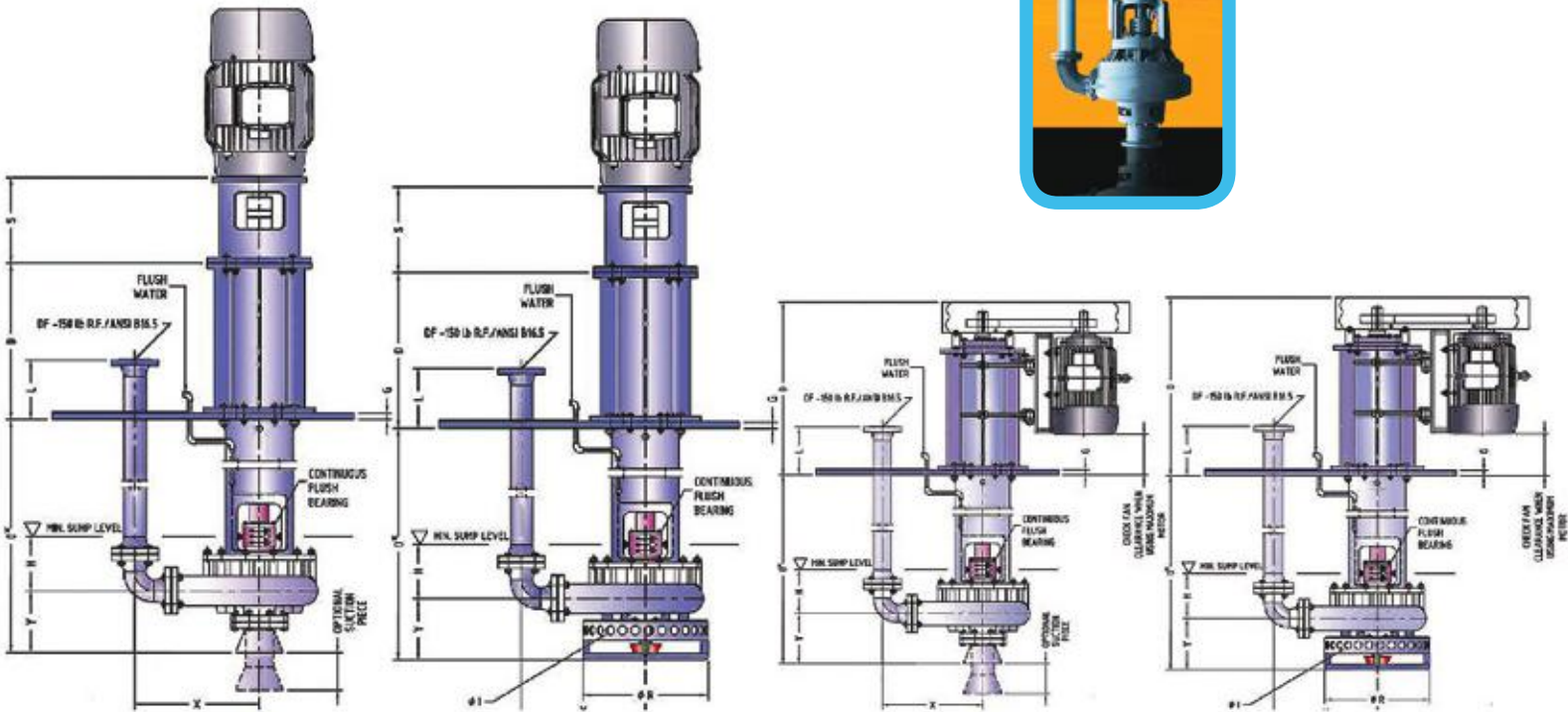


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HARNESS THE ADVANTAGES



Dimensional Specifications for DEVO



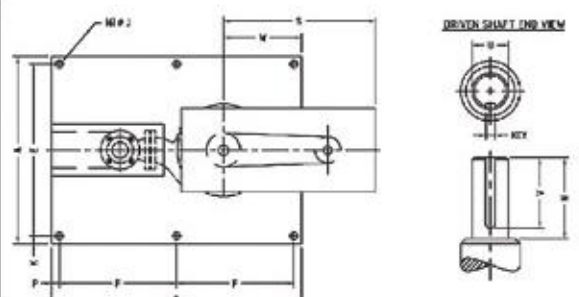
DIRECT DRIVE ASSEMBLY			
BRG HSG	max Motor Size	max D	max S
4E, 5E	445TC	731.4	620
		28.8	24.4

V-BELT ASSEMBLY			
BRG HSG	max Motor Size	max D	max S
4E, 5E	326 T	669.9	738.2
4E, 5E (with spacer)	444/ET	1219.2	1035
		48	40.8

(Toyo's standard settings) 96", 98", 120", 122", 144", 156" & 160"
(settings greater than 160" will require intermediate bearings)

Pump size	DF	L	H	X	Y
51-90	80	203	200	307.8	220.8
	3	8	7.5	15.7	8.7
61-90	50	203	200	305.0	263
	2	8	7.5	14.4	10.4
61-100	100	203	200	476.3	289.6
	4	8	7.5	18.9	9.4
71/72-50	50	203	200	416.0	289
	2	8	7.5	18.4	10.6
71/72-80	80	203	220	427.5	349.6
	3	8	8.7	19.2	9.8
81/82-50	50	203	220	502.6	262
	3	8	8.7	19.8	9.9
81/82-100	100	203	260	600	262
	4	8	9.6	23.6	10.3
81/82-150	150	203	260	807.8	364
	5	8	9.6	26.5	11.9
81/82-200	200	203	300	785	384
	8	8	11.8	30.2	15.1

Agitator	
ØR	ØI
381	28
15	1.1
381	25
15	1
381	42
15	1.7
381	25
15	1
381	28
15	1.1
508	35
20	1.4
508	50
20	2
625	65
207	2.8
600	65
25.8	2.8



Pump size		A	B	E	F	G	ØJ	K	P	W
51.80 to 81/82-150	4E, 5E	914.4	1219	838.2	571.5	25.4	22	38.1	38.1	361
		36	48	33	22.5	1	0.9	1.5	1.5	15
81/82-200	4E, 5E	914.4	1350	838.2	637	25.4	22	38.1	38.1	361
		36	53	33	25.1	1	0.9	1.5	1.5	15

Metric	mm
Imperial	inch

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HARNESS THE ADVANTAGES



This DBVO has been operating in the Coker area of a large US Steel Mill for over 2 years pumping a combination of coke fines, scale and slag without any maintenance problems or spare parts required.



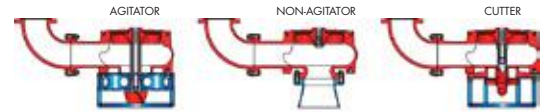
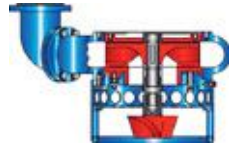
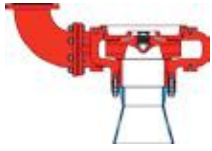
The DBVO is without any submerged seals and requires only a clear water flush to lubricate the unique bearing assembly.

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The Toyo Modular Program allows you the flexibility of using the wet ends below on various drive configurations. This advantage of the Toyo Product Line can significantly reduce spare parts inventory to an absolute minimum.



- Heavy solid handling capability
- Closed impeller
- Heavy metal sections for longer wear life
- Increased efficiencies in state of the art slurry pump design

- Heavy solid handling capability
- Closed and semi-open impellers available
- Patented Agitator Option
- Heavy metal sections for longer wear life

- Spiral casing design for increased efficiency and reduced wear
- Fully recessed impeller allows for large solids passage
- Only approx 15% of pumped liquid is in contact with impeller
- Wet end standard in High Chrome and CD4
- Patented Agitator and Chopper options available



HORIZONTAL



SUBMERSIBLE



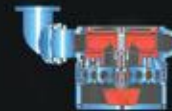
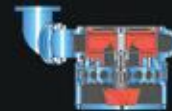
VERTICAL
CANTILEVER



LINE-SHAFT
STANDARD



LINE-SHAFT
'O' SERIES



Toyo Pumps North America
Corporate Head Office
2853 Douglas Rd
Burnaby, B.C.
Canada V5C 6H2



For more information please visit
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