



**CENTRIFUGAL
PROCESS PUMPS
ROBUST PUMPING POWER**





Providing pump solutions to industry, globally

Intrax is a global leader in specialist pumping equipment for difficult and challenging industrial applications. We are best known for excellence in bringing innovative and cost-saving ideas to our customers as well as offering unrivalled levels of customer service and response times.

Our combined wealth of experience and technical know-how in highly sophisticated applications has allowed us to work closely with the engineering teams on large-scale projects across the globe firmly establishing us as their trusted partner



an Intrax brand

Expertise

Intrax tackles aggressive and abrasive pumping challenges that conventional pump manufacturers shy away from. An in-depth cross organizational knowledge of aggressive fluid handling and an association with leading polymer developers and foundries globally provides a level of expertise disproportionate to the individual companies and brands.

Understanding

The Intrax companies and brands have truly evolved to relieve customer pain points and hence bring a refreshingly different approach to the rigid stance often taken by market incumbents. Intrax products have also evolved intelligently, influenced by individual customer's demands, and this progress is on-going.

Energy

Our partners often comment on the energy and motivation within our companies and how enjoyable it makes their interactions with us. We think that this is because of the ethos of our brilliant, highly-trained workforce who have been recruited to deliver cutting-edge solutions without the prejudices of a lifetime of offering conventional and often outdated technology

Innovation

A relentless drive to improve on the status quo of high value pump installations. Intrax has a culture of market disruption bringing value to customers, ranging from small, yet significant, product modifications which address regional challenges, to in-depth R&D and new product designs



TORO

In response to industry demand for a better serviced process pump

Empathy and Energy is at the heart of what Intrax is about. Over decades of listening to the market and while supplying various types of process pumps a common theme emerged:

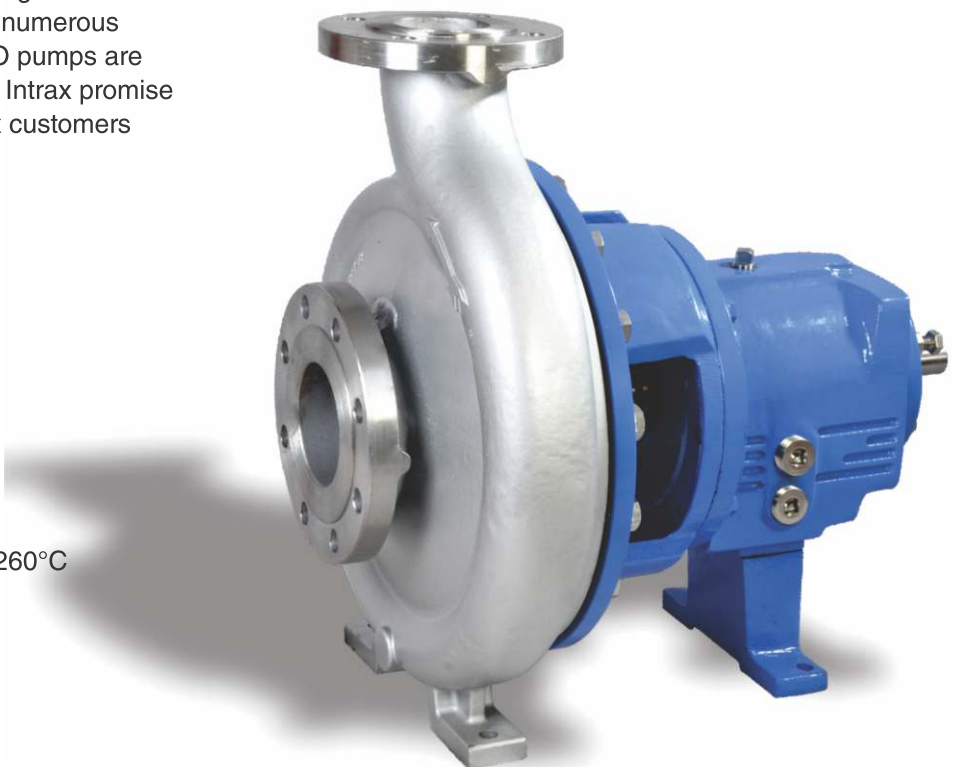
The demand for a centrifugal process pump with the same levels of service and support as other Intrax products

The TORO ANSI and ISO process pumps came about as a result of listening to our customers. Supplied as part of numerous projects around the globe TORO pumps are contributing to delivering on the Intrax promise with the 5 year guarantee Intrax customers have come to expect.

Pump types

ANSI B73.1 M (ASA 150)
ISO 2858/5199

Flows to 1000 m³/hr
Heads to 150 m
Liquid Temperatures -210°C to 260°C
Working pressures to 2550 kPa



TORO

ANSI B73.1 M (ASA 150)
ISO 2858/5199

Heavy Duty Process Pumps

Multiple wet end
and impeller
materials
(see page 6)

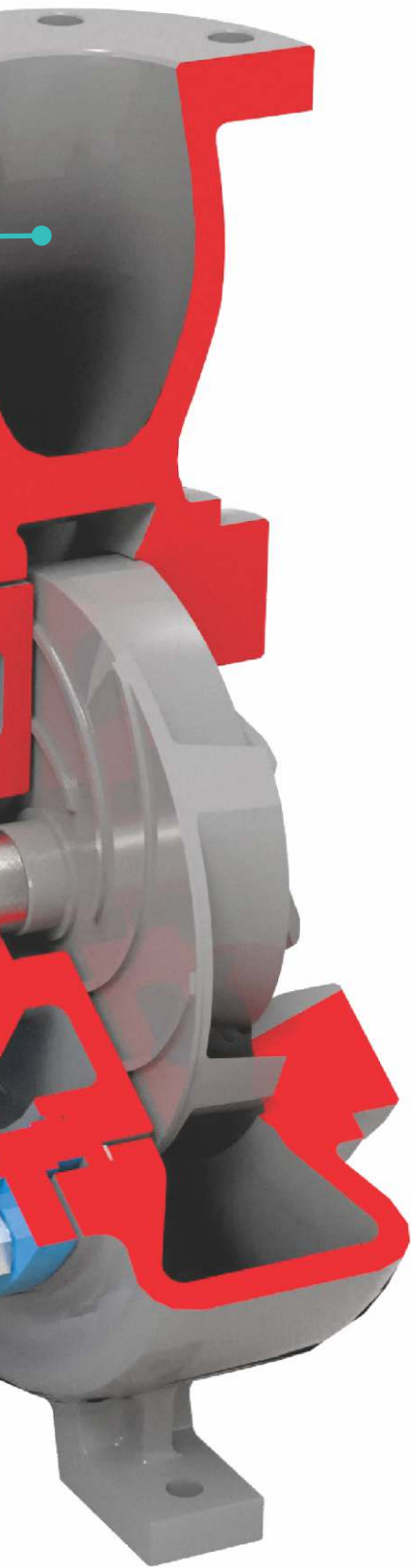
Non-metallic
coating alternatives
(see page 6)

Labyrinth
Seals

Industrial
SKF Bearings

Magnetic drain plug
for the oil chamber

Multiple sealing
options
(see page 5 & 7)



MECHANICAL SEAL DESIGN

We believe an integral approach is essential to ensure a reliable pump operation. As a manufacturer that understands seal design and specifications, TORO pumps are supplied with a reliable-by-design sealing system in either single and double mechanical seals configurations.

Mechanical seal criteria for TORO process pumps and why they contribute to reliability:

- Cartridge design: minimizes installation errors and ensures correct spring tension.
- Springs outside of the liquid: Avoids clogging or corrosion of spring material.
- Optimum seal environment to ensure long life. TORO process pumps offer stuffing box alternatives (see page 7) to facilitate an optimum seal life.
- Monolithic, o'ring dampened seal faces. Ensures reliability even with temperature changes or mechanical shocks
- Pressure balanced design. Reduces the effective of hydraulic forces on the seal faces, generating less friction and heat increasing seal life.
- Non-metallic variants. For highly corrosive materials we offer seal designs with no metallic parts in contact with the fluid.
- Diamond Encrusted Seal Faces. For abrasive fluid applications where flush is deficient or dry running may occur. Diamond Encrusted Seal Face heat dissipation properties are four times that of copper and are extremely wear resistant.



Contact us for brands and models that meet recommended design parameters

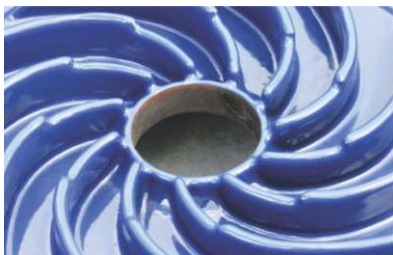
MATERIALS

MATERIAL	ASTM CASTING GRADE	TORO CODE
Cast Steel	WCB	335
SS-304	CF8	123
SS-316	CF8M	118
SS-316L	CF3M	125
CD4MCu	CD4MCu	121
Alloy - 20	CN7M	122
Carpenter 20	CK-20	127
Duplex SS	GRADE 4A,5A,6A	120
Hastelloy B	N12MV	129
Hastelloy C	CW12MW	131
Nickel (100%)	CZ-100	200
MONEL	M-35	133
Ni-Hard	Ni-Hard (Ni-Resistance)	329
Cast Titanium	B367 Grade C2/C3/C7	400

TORO pumps are available with a number of latest generation seamless technical coatings for an abrasion and corrosion resistant finish. Typically applied for light slurries or very corrosive fluids or corrosive fluids with abrasives, this treatment can avoid the need for exotic alloys and increase pump efficiency by up to 3.5%.

Typical applications include:

- Brine
- Acid brine
- Light slurries
- Waste fluids with suspended particles



PARTS

BEARING SEALING OPTIONS



Labyrinth Seals or Bearing Protectors can be provided for extended bearing life. It also provides maximum protection against contaminants and the corrosive effects of seal leakage or environmental conditions. Any known make can be provided.

JACKETED CASING & STUFFING BOX



1. For handling liquids having high boiling points & low melting points.
2. Steam arrangement can be provided for all crystallizing liquids.

DYNAMIC SEALING ARRANGEMENT (EXPELLER DESIGN)



1. For handling slurries/solids upto 35 - 40%
2. Eliminates use of Slurry Mechanical Seals and also eliminates product contamination and product dilution.

STUFFING BOX OPTIONS



Standard Bore:
Designed for packaging.
Also accommodates mechanical seals.



Big Bore:
Enlarged chamber for increased seal life through improved lubrication & cooling.

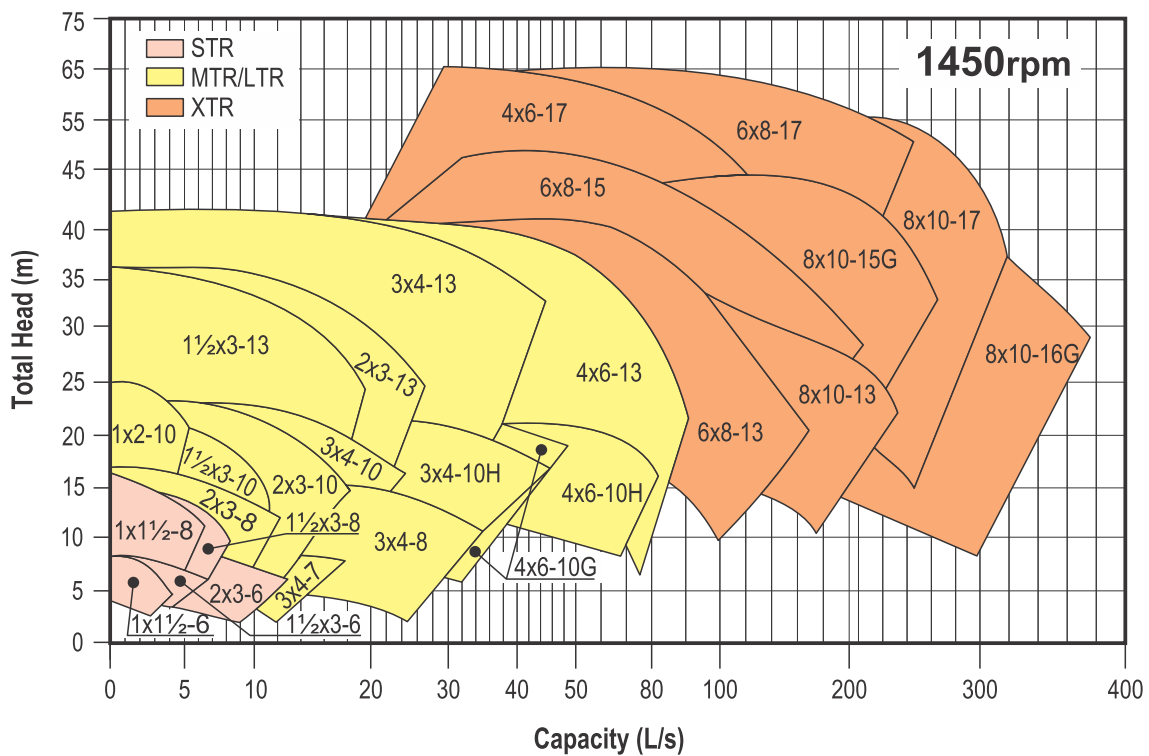
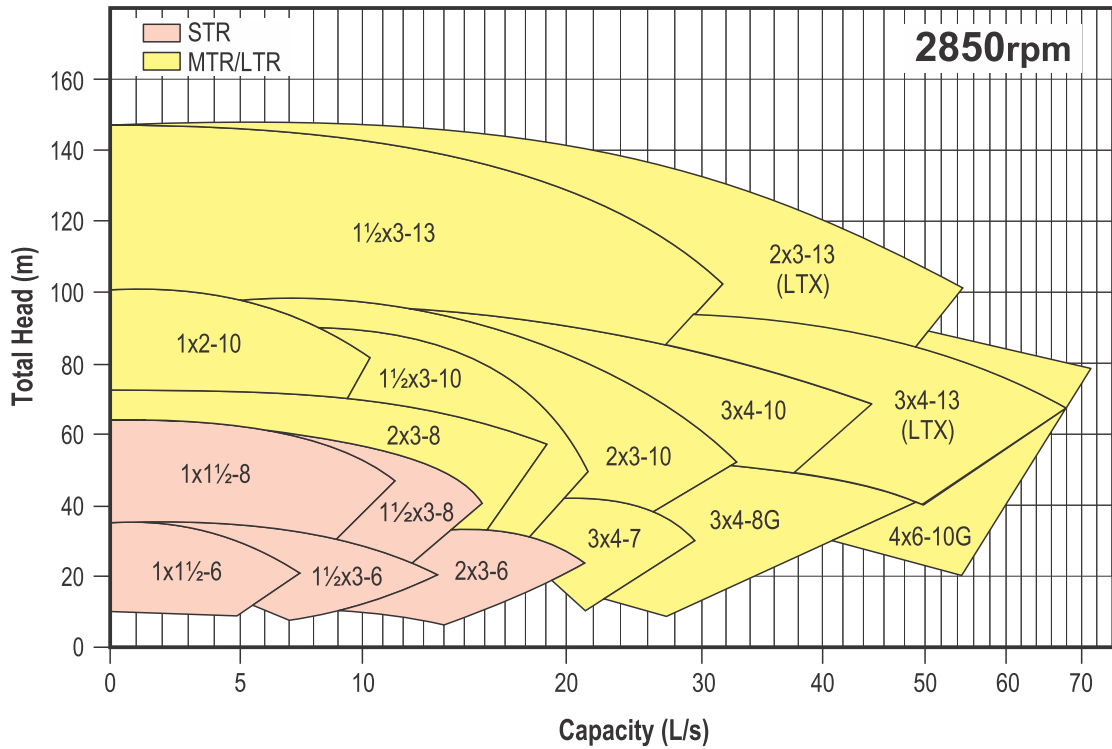


Taper Bore (conical stuffing box):
Lower Seal face temperatures, self-venting & draining. Solids & vapours circulated away from seal faces.

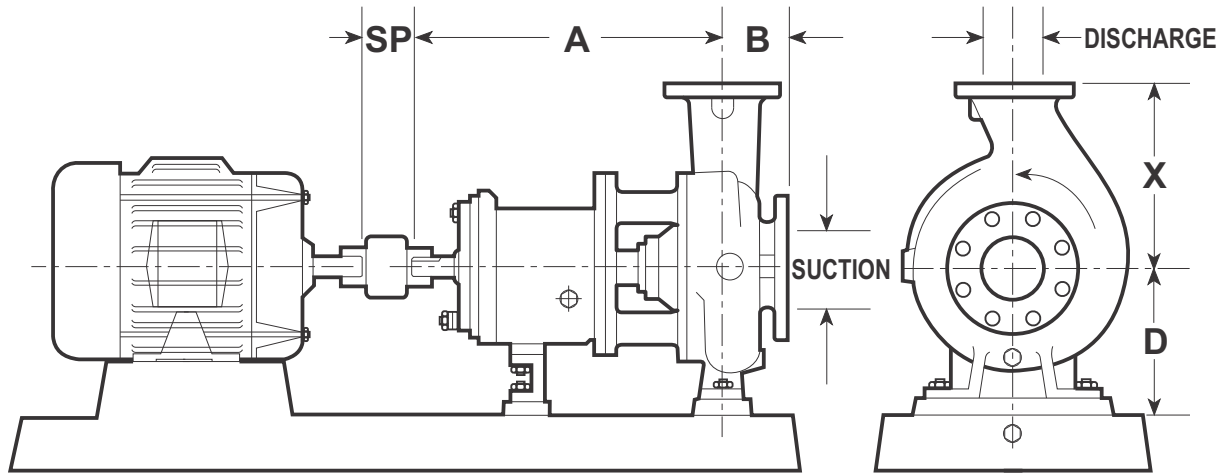
	Water Based liquids with flush	Entrained Air or Vapour	Solids 0-10% No Flush	Solids Greater than 10% with flush	Slurries 0-5%	High Boiling point Liquids No flush	Self-Venting & Draining	Seal Face Heat Removal
SB	A	C	C	B	C	C	C	C
BB	A	B	C	A	C	C	B	A
TB	A	A	A	C	A	A	A	A

A- Ideally Suited B- Acceptable C- Not Recommended

ANSI PUMPS PERFORMANCE RANGE

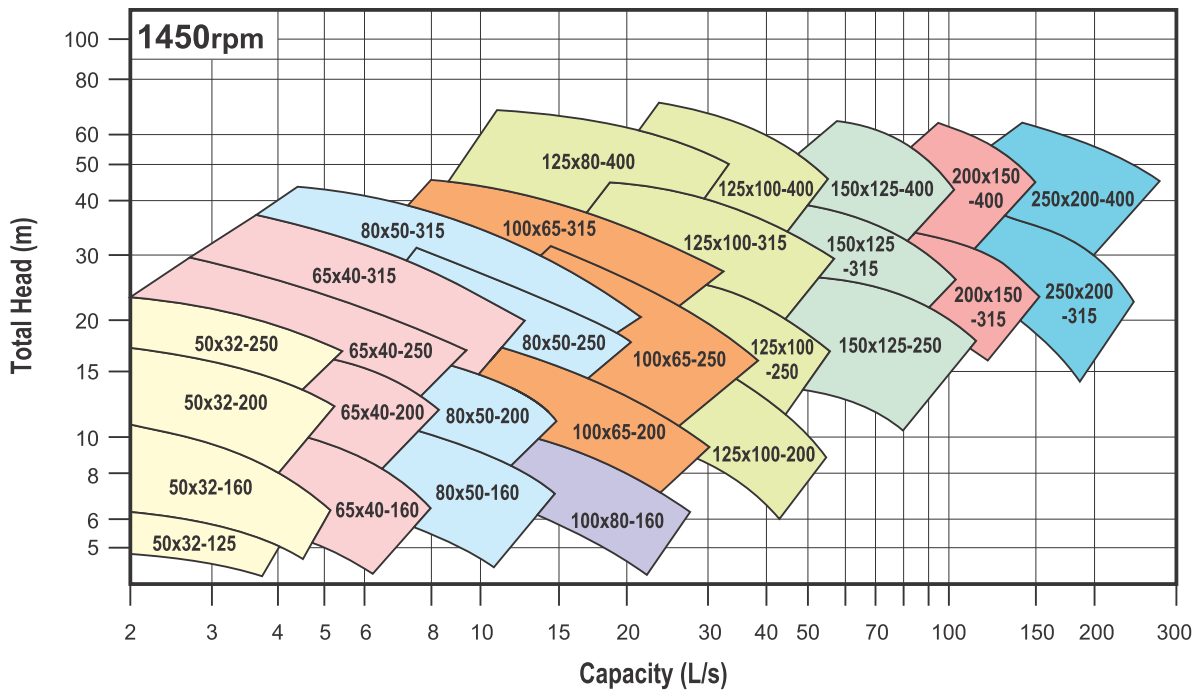
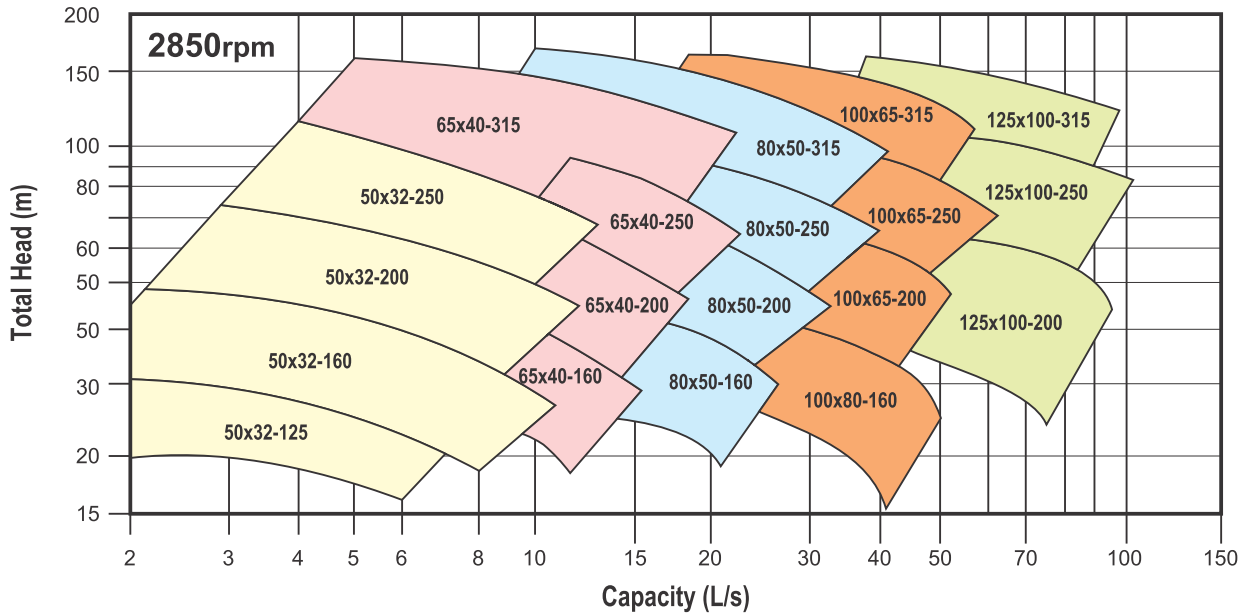


DIMENSIONS ANSI PUMPS

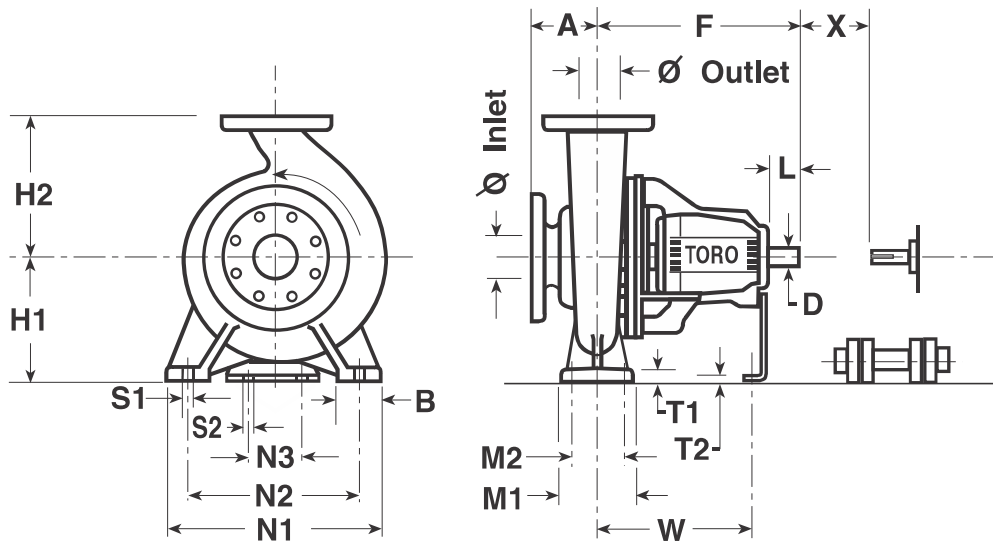


Group	Pump Size	ANSI Designation	Discharge Size	Suction Size	X	A	B	D	SP	Pump Weight Lbs. (kg.)
STR	1x1½-6	AA	1	1½	6.5 (165)	13.5 (343)	4 (102)	5.25 (133)	3.75 (95)	84 (38)
	1½x3-6	AB	1½	3						92 (42)
	2x3-6	AC	2	3						95 (43)
	1x1½-8	AA	1	1½						100 (45)
	1½x3-8	AB	1½	3						108 (49)
MTR/ LTR	3x4-7	A70	3	4	11 (280)	19.5 (495)	4 (102)	8.25 (210)	3.75 (95)	220 (100)
	2x3-8	A60	2	3	9.5 (242)					200 (91)
	3x4-8	A70	3	4	11 (280)					220 (100)
	3x4-8G	A70	3	4	8.5 (216)					220 (100)
	1x2-10	A05	1	2						200 (91)
	1½x3-10	A50	1½	3	220 (100)					
	2x3-10	A60	2	3	9.5 (242)	230 (104)				
	3x4-10'	A70	3	4	11 (280)	265 (120)				
	3x4-10H	A40	3	4	12.5 (318)	19.5 (495)	4 (102)	10 (254)	3.75 (95)	275 (125)
	4x6-10G	A80	4	6	13.5 (343)					305 (138)
	4x6-10H	A80	4	6	13.5 (343)					305 (138)
	1½x3-13	A20	1½	3	10.5 (267)					245 (111)
	2x3-13	A30	2	3	11.5 (292)					275 (125)
	3x4-13	A40	3	4	12.5 (318)	330 (150)				
	4x6-13	A80	4	6	13.5 (343)	405 (184)				
XTR	6x8-13	A90	6	8	16 (406)	27.88 (708)	6 (152)	14.5 (368)	5.25 (133)	560 (254)
	8x-10-13	A100	8	10	18 (457)					670 (304)
	6x8-15	A110	6	8	18 (457)					610 (277)
	8x10-15	A120	8	10	19 (483)					740 (336)
	8x10-15G									710 (322)
	8x10-16H	850 (385)								
	4x6-17	A105	4	6	16 (406)					650 (295)
	6x8-17	A110	6	8	18 (457)					730 (331)
8x10-17	A120	8	10	19 (483)	830 (376)					

ISO PUMPS PERFORMANCE RANGE



DIMENSIONS ISO PUMPS



PUMP SIZE			SHAFT No.	PUMP DIMENSIONS				MOUNTING DIMENSIONS							BOLT HOLES		SHAFT END		GAP *	PUMP MASS kg		
INLET	OUTLET	IMP DIA		A	F	H1	H2	B	M1	M2	N1	N2	N3	T1	T2	W	S1	S2			D	L
50	32	160	1	80	385	132	160	50	100	70	240	190	110	12	6	285	M12	M12	24	50	100	43
50	32	200	1	80	385	160	180	50	100	70	240	190	110	13	6	285	M12	M12	24	50	100	49
65	50	160	1	80	385	132	160	50	100	70	240	190	110	12	6	285	M12	M12	24	50	100	44
65	40	200	1	100	385	160	180	50	100	70	265	212	110	13	6	285	M12	M12	24	50	100	51
65	40	250	2	100	500	180	225	65	125	95	320	250	110	14	6	370	M12	M12	32	80	100	71
65	40	315	2	125	500	200	250	65	125	95	345	280	110	16	6	370	M12	M12	32	80	100	90
80	65	160	1	100	385	160	180	50	100	70	265	212	110	13	6	285	M12	M12	24	50	100	49
80	50	200	1	100	385	160	200	50	100	70	265	212	110	13	6	285	M12	M12	24	50	100	53
80	50	250	2	125	500	180	225	65	125	95	320	250	110	15	6	370	M12	M12	32	80	100	76
80	50	315	2	125	500	225	280	65	125	95	345	280	110	18	6	370	M12	M12	32	80	100	94
100	80	160	2	100	500	160	200	65	125	95	280	212	110	14	6	370	M12	M12	32	80	100	68
100	65	200	2	100	500	180	225	65	125	95	320	250	110	15	6	370	M12	M12	32	80	140	72
100	65	250	2	125	500	200	250	80	160	120	360	280	110	16	6	370	M16	M12	32	80	140	84
100	65	315	3	125	530	225	280	80	160	120	400	315	110	18	8	370	M16	M12	48	110	140	122
125	80	200	2	125	500	180	250	65	125	95	345	280	110	16	6	320	M12	M12	32	80	140	81
125	80	250	2	125	500	225	280	80	160	120	400	315	110	18	6	320	M16	M12	32	80	140	88
125	80	315	3	125	530	250	315	80	160	120	400	315	110	20	8	370	M16	M12	48	110	140	130
125	80	400	3	125	530	280	355	80	160	120	435	355	110	20	8	370	M16	M12	48	110	140	163
125	100	200	2	125	500	200	280	80	160	120	360	280	110	17	6	370	M16	M12	32	80	140	87
125	100	250	3	140	530	225	280	80	160	120	400	315	110	18	8	370	M16	M12	48	110	140	122
125	100	315	3	140	530	250	315	80	160	120	400	315	110	19	8	370	M16	M12	48	110	140	138
125	100	400	3	140	530	280	355	100	200	150	500	400	110	20	8	370	M20	M12	48	110	140	175
125	100	500	4	160	670	355	450	100	210	150	540	450	140	25	10	500	M20	M16	60	110	180	378
150	125	250	3	140	530	250	355	80	160	120	400	315	110	19	8	370	M16	M12	48	110	140	135
150	125	315	3	140	530	280	355	100	200	150	500	400	110	20	8	370	M20	M12	48	110	140	156
150	125	400	3	140	530	315	400	100	200	150	500	400	110	21	8	370	M20	M12	48	110	140	193
150	125	500	4	160	670	355	450	100	210	150	540	450	140	25	10	500	M20	M16	60	110	180	402
200	150	315	4	160	670	315	400	100	210	150	540	450	140	20	10	500	M20	M16	60	110	180	274
200	150	400	4	160	670	315	450	100	210	150	540	450	140	25	10	500	M20	M16	60	110	180	339
200	150	500	4	160	670	400	500	100	210	150	540	450	140	25	10	500	M20	M16	60	110	180	426
250	200	315	4	180	670	315	450	100	210	150	540	450	140	25	10	500	M20	M16	60	110	180	314

INSTALLATION LIST

INDUSTRY	EXAMPLES OF SERVICES		
CHEMICAL	<ul style="list-style-type: none"> • Sulphuric Acid • Sodium Hydroxide • Hydrochloric Acid • Acetic Acid • Ammonium Chloride 	<ul style="list-style-type: none"> • Brine • Chlorosulphonic Acid • Ethanol • Phosphoric Acid • Oleum 	<ul style="list-style-type: none"> • Nitric Acid • Maleic Acid • Citric Acid • Sodium Chloride • Vinyl Acetate
PETROCHEMICAL	<ul style="list-style-type: none"> • Butadiene • Benzene • Toluene • Ammonia • Methanol 	<ul style="list-style-type: none"> • Vinyl Chloride • Ethylene Glycol • Maleic Anhydride • Acrylonitrile • Urea 	<ul style="list-style-type: none"> • Formaldehyde • Phenol • Styrene • Ethylene Oxide • Xylene
PULP & PAPER	<ul style="list-style-type: none"> • Shower Water • White Water • Chlorine Dioxide 	<ul style="list-style-type: none"> • Sodium Hypochlorite • Fresh Liquor • Black Liquor 	<ul style="list-style-type: none"> • Green Liquor • Dregs Washer • White Liquor
BREWING	<ul style="list-style-type: none"> • Sparge Water • Hot / Cold Wort • Chilled Water • Beer 	<ul style="list-style-type: none"> • Reclaim Water • Mash • Blow Black Beer • Spent Grain Liquor 	<ul style="list-style-type: none"> • Alcohol Transfer • Yeast Brink • Sulphuric Acid • Caustic
PRIMARY METALS	<ul style="list-style-type: none"> • Copper Cyanide • Sodium Cyanide • Chromic Acid 	<ul style="list-style-type: none"> • Sodium Sulphate • Ferric Chloride • Ferrous Sulphate 	<ul style="list-style-type: none"> • Copper Sulphate • Ammonium Sulphate • Silver Cyanide
GENERAL	<ul style="list-style-type: none"> • Condensate • Deionized Water • Shower Water 	<ul style="list-style-type: none"> • Hot Oil • Wine • Sugar Cane Juice 	<ul style="list-style-type: none"> • River Water • Saline Water • Cooling Tower Water



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