

Wilo NL
Base Mount End Suction Pumps

Technical Bulletin

1 General

1.1 Background Information

- For hydronic heating and cooling systems, industrial, pressure boosting and general pumping applications
- High efficiency, low operating costs
- Easy maintenance
- Seal options

1.2 Useful Pump Formulas

- Pressure (psi) = [Head (Feet)xSpecific Gravity]/2.31
- Head (Feet) = [Pressure (psi)x2.31]/ Specific Gravity
- Vacuum (Inches of Mercury) = Dynamic Suction Lift (Feet)x.833x Specific Gravity
- Horsepower (Brake) = [GPMxHead (Feet)xSpecific Gravity]/[3960 x Pump Eff.]
- Horsepower (water) = [GPMxHead (Feet)xSpecific Gravity]/3960
- Efficiency (Pump) = [Horsepower (Water)/Horsepower (brake)] x 100%
- NPSH (available) = Positive Factors - Negative Factors

1.3 Affinity Laws:

Effect of change of speed or impeller diameter on centrifugal pumps

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = (D_2/D_1)Q_1$	$H_2 = (D_2/D_1)^2H_1$	$P_2 = (D_2/D_1)^3P_1$
Speed Change	$Q_2 = (RPM_2/RPM_1)Q_1$	$H_2 = (RPM_2/RPM_1)^2H_1$	$P_2 = (RPM_2/RPM_1)^3P_1$

Where:

- Q = GPM
- H = Head
- P = BHP
- D = Impeller Diameter
- RPM = Pump Speed

2 Standard Pump Features

2.1 True Back Pullout

A Wilo standard in design and construction. Ease in service is assured, while piping and motor remain undisturbed. Extended delays for repairs are virtually eliminated.

2.2 Internally Self-Flushing Mechanical Seal

This unique seal design is proven in many years of service. It requires no special external flushing provisions, since the design provides for constant efficient flushing action internally.

This standard feature ensures maximum seal face lubrication, heat dissipation and debris removal without vulnerable, external flush tubing. The internal flushing action passes two and a half to three times the flow over the seal faces — compared to a few GPM for conventional, stuffing-box/external flush designed pumps.

2.3 Computer Controlled Impeller Balancing

NL (End Suction) Series impellers are balanced to HI/ANSI 1.1-1.5-1994 section 1.4.6.1.3.1, balance grade G6.3 standards. This method of computer balancing impellers provides for quiet, efficient, vibration free performance. Diameters are computer selected at the factory to furnish assurance that your capacity requirements will be met.

2.4 Heavy Duty, Rugged Baseplate

The Wilo fabricated heavy duty baseplate is supplied as standard on every NL (End Suction) Series pump. Unlike rolled steel and "C" channel baseplates, the NL (End Suction) Series baseplate provides a heavy duty saddle assembly, seam welds, closed baseplate ends and an open top to provide ease of access for proper equipment grouting. See Figure 1.

2.5 Solid-Foot Mounted Casing

All NL (End Suction) Series pumps are provided as standard with an integrally cast volute foot located directly beneath the pump volute. This integrally cast foot ensures that the alignment between the volute and motor assembly is maintained. Without solid support beneath the volute, the piping weight alone will cause distortion which can lead to premature failure of the bearings, shaft and mechanical seal. This feature is equally important on hot water applications. The NL (End Suction) Series volute foot provides a solid foundation and eliminates the deflections which would otherwise exist within an unsupported overhung volute during the normal thermal expansion of the system piping against the volute. See Figure 1.

2.6 ANSI/OSHA-Complaint Coupling Guard

The coupler guard complies with ANSI B15.1, Section 8 and OSHA 1910.219. The guard offers increased protection against potential injuries and is standard on all NL (End Suction) Series pumps. The guards include slotted viewing windows for easy inspection. See Figure 2.

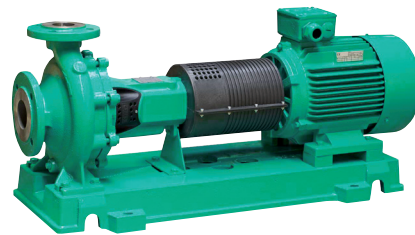


Figure 1: Standard NL Series pump mounted to a heavy duty, rugged baseplate with solid foot mounted casing



Figure 2: Coupling Guard

3 Technical Data

3.1 Balance Standards

Impellers are balanced to Hydraulic Institute Standards (ANSI/HI 1.1-1.5-1994), section 1.4.6.1.3.1 Refer to Figure 1.106.

The allowable residual unbalance in the impeller rotating assembly conforms to ANSI grade G6.3.

ANSI Balance Quality Grades of G2.5 and G1 for the rotating assembly are also available. Consult your local Wilo Representative for additional details.

3.2 Vibration Limits

NL (End Suction) Series pumps conform to Hydraulic Institute ANSI/HI 1.1-1.5-1994, section 1.4.6.1.1 for recommended acceptable unfiltered field vibration limits (as measured at the pump bearings per H.I. 1.4.6.5.2, Refer to Figure 1.108.) for pumps with rolling contact bearings.

Pump Speed RPM	Overall Displacement (Unfiltered) Peak to Peak - Mils [.001" (.025mm)]
3600	2.2
1800	3.8
1200	5.8

3.3 Seismic Capabilities

NL (End Suction) Series pumps are capable of withstanding a horizontal load of 0.5g* without adversely affecting pump operation.

*Piping and/or fasteners used to anchor the pump to the mounting pads on the floor are excluded.

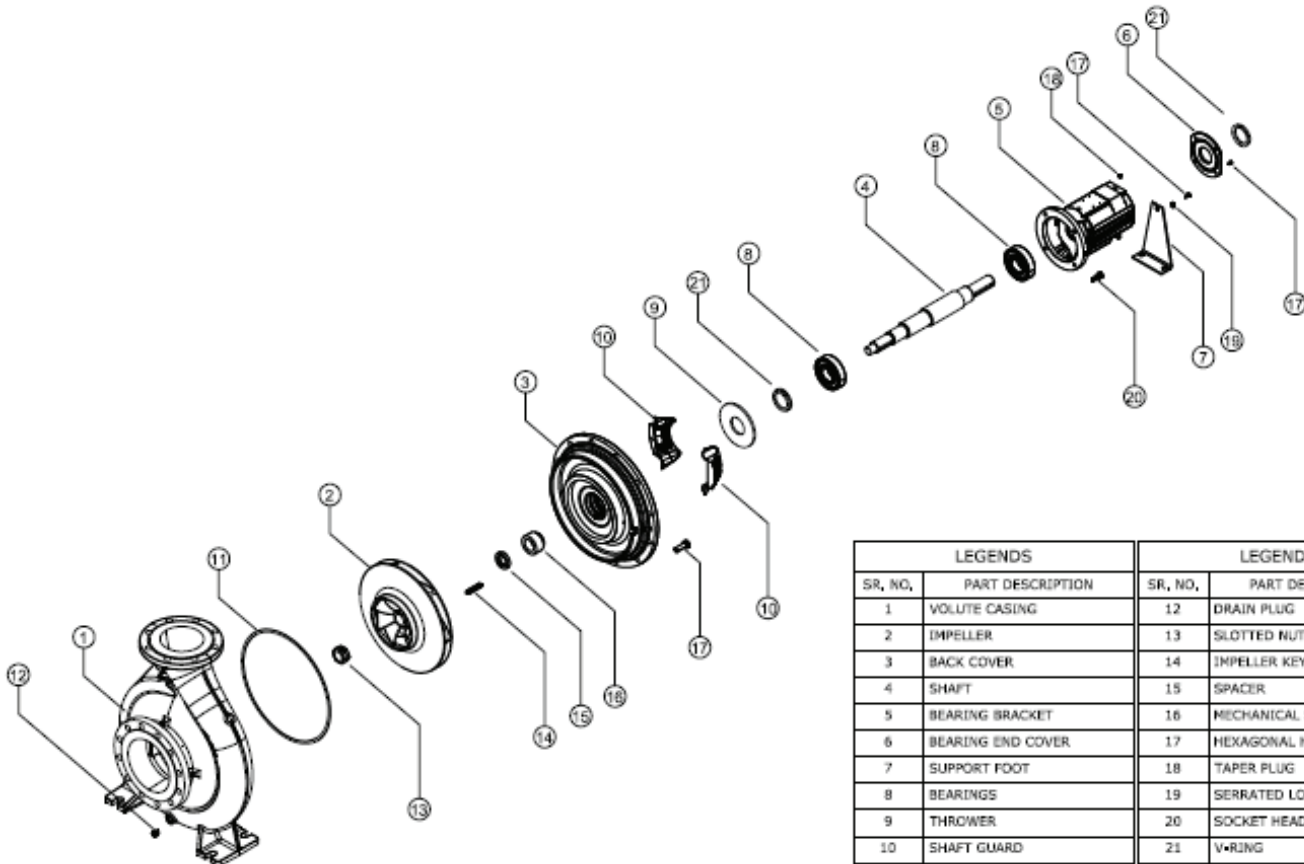
3.4 Mechanical Seal

Seal Features	
Standard Seal Type	Wilo
Internally Flushed Seal	Yes
Enlarged Seal Chamber	Yes
Standard Seal Construction	Type MG1 AQ1EGG
Standard Working Pressure	175 psig (12 Bar)
Maximum Working Pressure	250 psig (17 Bar)
Standard Seal Temperature Rating	250 deg F [120 deg C]
Optional Temperature Rating	285 deg F [140 deg C]

The ceramic material is 99.5% pure alumina oxide, ceramic hardness of 68 Rockwell C, or tensile strength 300,000 psi.

4 Materials of Construction

4.1 Exploded View of Standard NL (End Suction) Series Pump



LEGENDS		LEGENDS	
SR. NO.	PART DESCRIPTION	SR. NO.	PART DESCRIPTION
1	VOLUTE CASING	12	DRAIN PLUG
2	IMPELLER	13	SLOTTED NUT
3	BACK COVER	14	IMPELLER KEY
4	SHAFT	15	SPACER
5	BEARING BRACKET	16	MECHANICAL SEAL
6	BEARING END COVER	17	HEXAGONAL HEAD SCREW
7	SUPPORT FOOT	18	TAPER PLUG
8	BEARINGS	19	SERRATED LOCK WASHER
9	THROWER	20	SOCKET HEAD CAP SCREW
10	SHAFT GUARD	21	O-RING
11	GASKET	-	-

Item No.	Description	Cast Iron, Bronze Fitted Pump (Standard Configuration)	All Cast Iron Pump (Optional)
1	Volute Casing	Cast Iron (FG 260)	Cast Iron (FG 260)
2	Impeller	Bronze (LG2)	Cast Iron (FG 260)
3	Casing Back Cover	Cast Iron (FG 260)	Cast Iron (FG 260)
4	Shaft	Stainless Steel AISI 420	Stainless Steel AISI 420
5	Bearing Bracket	Cast Iron (FG 260)	Cast Iron (FG 260)
6	Bearing End Cover	Cast Iron (FG 260)	Cast Iron (FG 260)
7	Support Foot	Steel	Steel
8	Ball Bearing	Steel	Steel
11	Casing Gasket	Aramid Fibers	Aramid Fibers
13	Impeller Nut	Stainless Steel AISI 420	Stainless Steel AISI 420
14	Impeller Key	Steel	Steel
16	Mechanical Seal Assembly	MG1 AQ1EGG	MG1 AQ1EGG
21	V-Ring	Rubber	Rubber

4.2 Standard Pump Construction

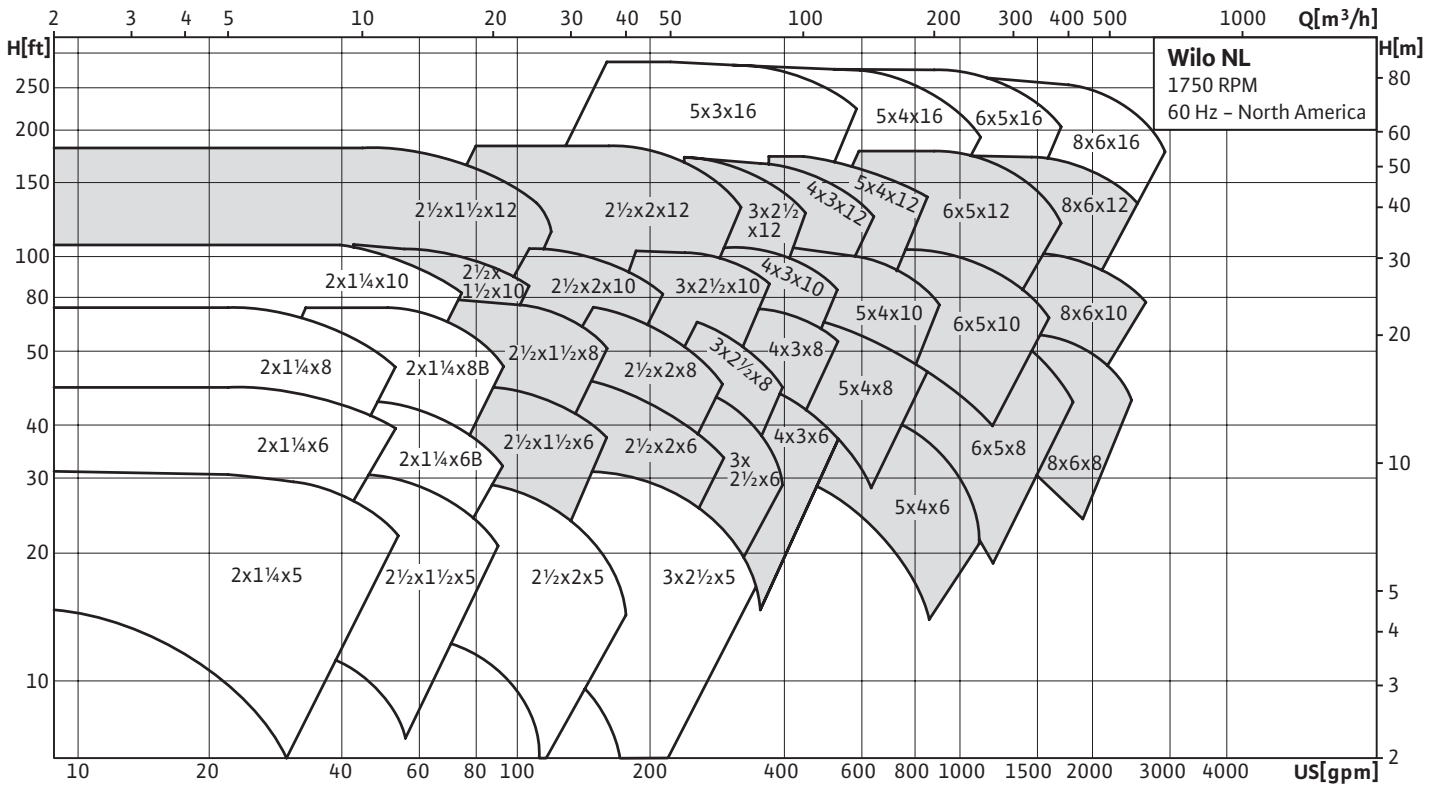
- 175 psig (12 Bar) Maximum Working Pressure
- 150 psig (10 Bar) Maximum Suction / Inlet Pressure
- 125 # FF ANSI Flange (ANSI A21.10, AWWA C110 and ANSI B16.1 Class 125)

4.3 Optional Pump Construction

- 250 psig (17 Bar) Maximum Working Pressure
- 150 psig (10 Bar) Maximum Suction / Inlet Pressure
- 250 # FF ANSI Flange (ANSI B16.1 Class 250)

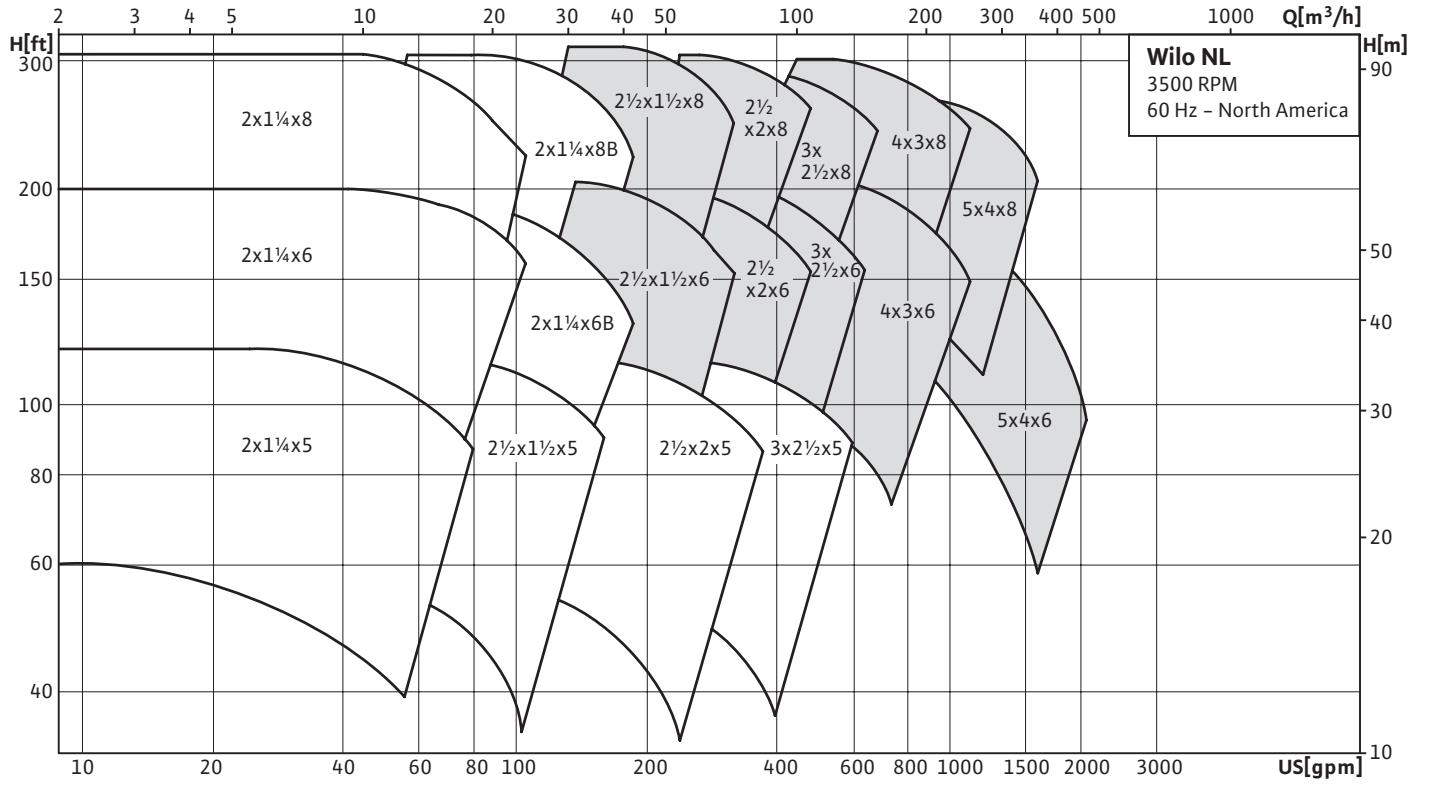
5 60 Cycle Performance Curves

5.1 1750 RPM Performance Curves

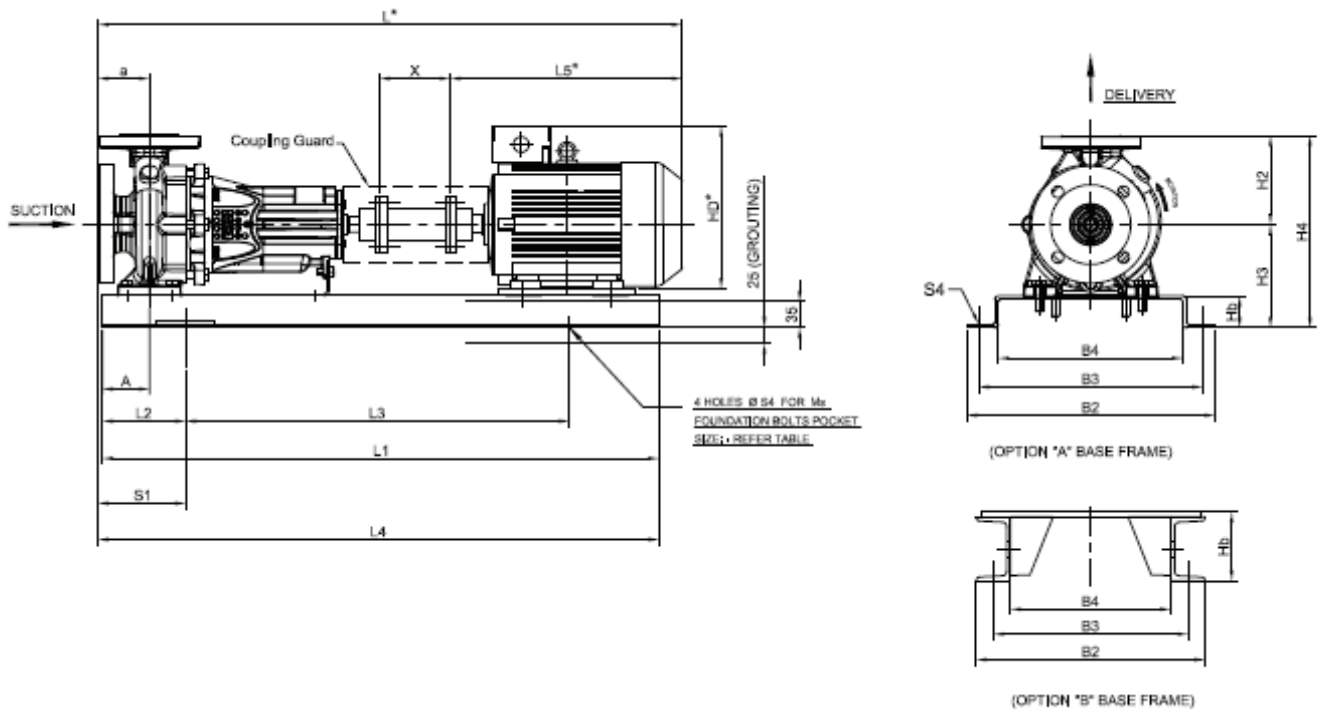


Denotes Stock Pump

5.2 3500 RPM Performance Curves



6 Dimensions



- Standard: 125 # FF ANSI Flange (ANSI A21.10, AWWA C110 and ANSI B16.1 Class 125)
- Optional: 250 # FF ANSI Flange (ANSI B16.1 Class 250)
- Dimensions are subject to change.
- Not to be used for construction purposes unless certified.
- * Motor Dimensions are approximate for "T" frames.
- Vary by manufacturer and motor type.
- "X" = .50 [13mm]
- Dimensions in inches [mm]

6.1 1750 RPM

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 2 1/2 x 1 1/2 x 12	145T	3.75 [95]	38.31 [973]	29.50 [749]	46.44 [1180]	14.38 [365]	12.88 [327]	22.68 [576]	9.00 [229]	6.81 [173]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	1300 [330]	.88 [22]	9.91 [249]	4.94 [125]
	182T-184T	3.75 [95]	40.44 [1027]	29.50 [749]	46.44 [1180]	16.50 [419]	12.88 [327]	22.68 [576]	9.00 [229]	8.94 [227]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	1300 [330]	.88 [22]		
	213T-215T	3.75 [95]	42.88 [1089]	29.50 [749]	46.44 [1180]	18.94 [481]	12.88 [327]	22.68 [576]	9.00 [229]	10.00 [254]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	1300 [330]	.88 [22]		
	254T-256T	3.75 [95]	47.13 [1197]	29.50 [749]	46.44 [1180]	23.19 [589]	12.88 [327]	22.68 [576]	9.00 [229]	12.00 [302]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	16.19 [411]	1300 [330]	.88 [22]		
NL 2 1/2 x 1 1/2 x 10	145T	3.06 [78]	34.19 [868]	21.56 [548]	34.19 [868]	15.56 [395]	9.44 [240]	18.31 [465]	6.75 [171]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	8.88 [225]	3.94 [100]
	182T-184T	3.06 [78]	36.63 [931]	21.56 [548]	34.19 [868]	18.06 [458]	9.44 [240]	18.31 [465]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
	213T	3.06 [78]	37.56 [954]	21.56 [548]	34.19 [868]	18.94 [481]	9.44 [240]	18.31 [465]	6.75 [171]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 2 1/2 x 1 1/2 x 8	145T	3.06 [78]	33.00 [838]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	15.75 [400]	6.75 [171]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.06 [179]	3.94 [100]
	182T-184T	3.06 [78]	35.13 [892]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	15.75 [400]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		

6.1 1750 RPM, continued

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 2 1/2 x 1 1/2 x 6	56	2.63 [67]	31.19 [792]	21.00 [533]	33.38 [848]	13.38 [339]	7.56 [192]	13.88 [352]	6.44 [164]	6.38 [161]	32.81 [833]	5.88 [149]	2.38 [60]	14.88 [378]	13.13 [333]	10.94 [278]	.88 [22]	6.31 [160]	3.13 [79]
	143T-145T	2.63 [67]	32.25 [818]	21.00 [533]	33.38 [848]	14.38 [365]	7.56 [192]	13.88 [352]	6.44 [164]	6.81 [173]	32.81 [833]	5.88 [149]	2.38 [60]	14.88 [378]	13.13 [333]	10.94 [278]	.88 [22]		
	182T-184T	2.63 [67]	34.31 [872]	21.00 [533]	33.38 [848]	16.50 [419]	7.56 [192]	13.88 [352]	6.44 [164]	8.44 [214]	32.81 [833]	5.88 [149]	2.38 [60]	14.88 [378]	13.13 [333]	10.94 [278]	.88 [22]		
NL 2 1/2 x 2 x 12	213T-215T	3.75 [96]	42.88 [1089]	29.50 [750]	46.44 [1180]	18.94 [481]	12.88 [327]	23.88 [607]	9.00 [229]	10.00 [254]	45.25 [1150]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	11.00 [279]	4.94 [125]
	254T-256T	3.75 [96]	47.13 [1197]	29.50 [750]	46.44 [1180]	23.19 [589]	12.88 [327]	23.88 [607]	9.00 [229]	15.63 [397]	45.25 [1150]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284T	3.75 [96]	50.38 [1280]	29.50 [750]	46.44 [1180]	26.44 [672]	12.88 [327]	23.88 [607]	9.00 [229]	13.63 [346]	45.25 [1150]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 2 1/2 x 2 x 10	182T-184T	3.06 [78]	36.63 [931]	21.56 [548]	34.19 [868]	16.50 [419]	9.44 [240]	18.31 [465]	6.75 [171]	8.94 [227]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	8.88 [225]	3.94 [100]
	213T-215T	3.06 [78]	37.56 [954]	21.56 [548]	34.19 [868]	18.94 [481]	9.44 [240]	18.31 [465]	6.75 [171]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 2 1/2 x 2 x 8	145T	3.06 [78]	33.00 [838]	21.56 [248]	34.19 [868]	14.38 [365]	8.69 [221]	16.50 [420]	6.75 [171]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.88 [200]	3.94 [100]
	182T-184T	3.06 [78]	35.06 [891]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	16.50 [420]	6.75 [171]	11.25 [285]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
	213T	3.06 [78]	37.50 [954]	21.56 [548]	34.19 [868]	20.50 [521]	8.69 [221]	16.50 [420]	6.75 [171]	13.00 [330]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 2 1/2 x 2 x 6	143T-145T	3.06 [78]	33.00 [838]	21.56 [548]	34.19 [868]	14.38 [365]	8.69 [221]	15.75 [400]	6.75 [171]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.06 [179]	3.94 [100]
	182T-184T	3.06 [78]	35.13 [892]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	15.75 [400]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 3 x 2 1/2 x 12	254T-256T	3.75 [95]	47.13 [1197]	31.75 [807]	52.63 [1337]	23.19 [589]	12.88 [327]	23.88 [607]	11.00 [279]	15.63 [397]	51.44 [1307]	9.81 [249]	4.00 [102]	15.75 [400]	17.50 [445]	15.75 [400]	.88 [22]	11.00 [279]	4.94 [125]
	284T-286T	3.75 [95]	50.38 [1280]	31.75 [807]	52.63 [1337]	26.44 [672]	12.88 [327]	23.88 [607]	11.00 [279]	16.38 [415]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 3 x 2 1/2 x 10	184T	3.75 [95]	36.44 [1002]	29.50 [749]	45.44 [1154]	16.50 [419]	11.88 [302]	21.69 [551]	8.06 [205]	10.00 [254]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	9.81 [249]	3.94 [100]
	213T-215T	3.75 [95]	41.88 [1064]	29.50 [749]	45.44 [1154]	18.94 [481]	11.88 [302]	21.69 [551]	8.06 [205]	13.00 [330]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	254T	3.75 [95]	46.13 [1172]	29.50 [749]	45.44 [1154]	23.19 [589]	11.88 [302]	21.69 [551]	8.06 [205]	15.63 [397]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 3 x 2 1/2 x 8	182T-184T	3.06 [78]	35.06 [891]	21.56 [548]	34.19 [868]	16.50 [419]	9.44 [240]	18.31 [465]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	8.88 [225]	3.94 [100]
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NL 3 x 2 1/2 x 6	145T	3.06 [78]	33.00 [838]	21.56 [548]	34.19 [868]	14.38 [365]	8.69 [221]	16.56 [421]	6.75 [171]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.88 [200]	3.94 [100]
	182T-184T	3.06 [78]	35.13 [892]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	16.56 [421]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
	213T	3.06 [78]	37.56 [954]	21.56 [548]	34.19 [868]	18.94 [481]	8.69 [221]	16.56 [421]	6.75 [171]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 4 x 3 x 12	254T-256T	3.75 [95]	47.13 [1197]	31.75 [807]	52.63 [1337]	23.19 [588]	13.81 [351]	26.25 [667]	11.00 [279]	15.63 [397]	51.44 [1307]	9.81 [25.4]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	12.38 [314]	4.94 [125]
	284T-286T	3.75 [95]	50.38 [1280]	31.75 [807]	52.63 [1337]	26.44 [672]	13.81 [351]	26.25 [667]	11.00 [279]	13.63 [346]	51.44 [1307]	9.81 [25.4]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	324T	3.75 [95]	53.38 [1356]	31.75 [807]	52.63 [1337]	29.44 [748]	13.81 [351]	26.25 [667]	11.00 [279]	15.56 [395]	51.44 [1307]	9.81 [25.4]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 4 x 3 x 10	213T-215T	3.75 [95]	42.88 [1089]	31.75 [806]	52.63 [1337]	20.50 [521]	11.88 [302]	22.88 [581]	11.00 [279]	13.00 [330]	51.44 [1307]	9.81 [25.4]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	11.00 [279]	4.94 [125]
	254T-256T	3.75 [95]	47.06 [1195]	31.75 [806]	52.63 [1337]	23.19 [589]	11.88 [302]	22.88 [581]	11.00 [279]	15.63 [397]	51.44 [1307]	9.81 [25.4]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 4 x 3 x 8	182T-184T	3.75 [95]	40.44 [1027]	29.50 [749]	46.44 [1180]	16.50 [419]	11.06 [281]	20.94 [532]	9.00 [229]	8.44 [214]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	9.81 [249]	4.94 [125]
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	254T	3.75 [95]	47.06 [1195]	29.50 [749]	46.44 [1180]	23.19 [588]	11.06 [281]	20.94 [532]	9.00 [229]	15.63 [397]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		

6.1 1750 RPM, continued

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 4 x 3 x 6	145T	3.06 [78]	35.3 [893]	21.56 [548]	35.19 [894]	14.38 [365]	9.44 [238]	18.31 [465]	7.75 [197]	6.81 [173]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	8.88 [225]	4.94 [125]
	182T-184T	3.06 [78]	36.13 [917]	21.56 [548]	35.19 [894]	16.50 [419]	9.44 [238]	18.31 [465]	7.75 [197]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
	213T	3.06 [78]	38.56 [980]	21.56 [548]	35.19 [894]	18.94 [481]	9.44 [238]	18.31 [465]	7.75 [197]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
NL 5 x 4 x 12	286T	3.75 [95]	50.94 [1394]	31.75 [806]	53.19 [1351]	26.44 [672]	13.81 [351]	26.25 [642]	11.56 [294]	13.63 [346]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	12.38 [314]	5.50 [140]
	324T-326T	3.75 [95]	53.94 [1370]	31.75 [806]	53.19 [1351]	29.44 [748]	13.81 [351]	26.25 [642]	11.56 [294]	15.56 [395]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364T-365T	3.75 [95]	58.25 [1480]	31.75 [806]	53.19 [1351]	33.75 [857]	13.81 [351]	26.25 [642]	11.56 [294]	21.75 [552]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS-365TS	3.75 [95]	53.06 [1347]	31.75 [806]	53.19 [1351]	28.56 [725]	13.81 [351]	26.25 [642]	11.56 [294]	16.56 [421]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	404T-405T	4.56 [116]	62.50 [1588]	36.25 [921]	56.88 [1445]	38.00 [965]	14.00 [356]	26.38 [670]	10.81 [274]	18.44 [468]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
	405TS	4.56 [116]	59.13 [1502]	36.25 [921]	56.88 [1445]	34.63 [880]	14.00 [356]	26.38 [670]	10.81 [274]	18.44 [468]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
NL 5 x 4 x 10	215T	3.75 [95]	43.63 [1109]	31.75 [806]	26.44 [672]	18.94 [481]	12.88 [327]	23.88 [606]	11.56 [294]	10.00 [254]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	11.00 [279]	5.50 [140]
	254T-256T	3.75 [95]	47.50 [1207]	31.75 [806]	26.44 [672]	23.13 [588]	12.88 [327]	23.88 [606]	11.56 [294]	12.00 [305]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	284T	3.75 [95]	50.94 [1394]	31.75 [806]	26.44 [672]	26.44 [672]	12.88 [327]	23.88 [606]	11.56 [294]	13.63 [346]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 5 x 4 x 8	182T-184T	3.75 [95]	40.44 [1027]	29.50 [749]	46.44 [1180]	16.50 [419]	11.88 [302]	22.88 [581]	9.00 [229]	8.44 [214]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	11.00 [279]	4.94 [125]
	213T-215T	3.75 [95]	42.88 [1089]	29.50 [749]	46.44 [1180]	18.94 [481]	11.88 [302]	22.88 [581]	9.00 [229]	10.00 [254]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	254T	3.75 [95]	47.13 [1197]	29.50 [749]	46.44 [1180]	23.19 [588]	11.88 [302]	22.88 [581]	9.00 [229]	12.00 [305]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 5 x 4 x 6	184T	3.75 [95]	40.44 [1027]	29.50 [749]	46.44 [1180]	16.50 [419]	11.88 [302]	22.88 [581]	9.00 [229]	8.44 [214]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	11.00 [279]	4.94 [125]
	213T-215T	3.75 [95]	42.88 [1089]	29.50 [749]	46.44 [1180]	18.94 [481]	11.88 [302]	22.88 [581]	9.00 [229]	10.00 [254]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	254T	3.75 [95]	47.06 [1195]	29.50 [749]	46.44 [1180]	23.19 [588]	11.88 [302]	22.88 [581]	9.00 [229]	15.63 [397]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 6 x 5 x 12	286T	4.56 [116]	53.31 [1354]	36.25 [921]	56.88 [1445]	26.44 [672]	15.00 [381]	29.00 [737]	10.81 [275]	13.63 [346]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]	14.00 [356]	5.50 [140]
	324T-326T	4.56 [116]	56.31 [1430]	36.25 [921]	56.88 [1445]	29.44 [748]	15.00 [381]	29.00 [737]	10.81 [275]	15.63 [397]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
	364T-365T	4.56 [116]	60.63 [1540]	36.25 [921]	56.88 [1445]	33.75 [857]	15.00 [381]	29.00 [737]	10.81 [275]	21.75 [552]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
	364TS-365TS	4.56 [116]	55.44 [1408]	36.25 [921]	56.88 [1445]	28.56 [725]	15.00 [381]	29.00 [737]	10.81 [275]	16.56 [421]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
NL 6 x 5 x 10	254T-256T	3.75 [95]	47.50 [1207]	31.75 [806]	53.19 [1351]	23.13 [588]	13.81 [351]	27.81 [706]	11.56 [294]	12.00 [305]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	14.00 [356]	5.50 [140]
	284T-286T	3.75 [95]	50.94 [1294]	31.75 [806]	53.19 [1351]	26.44 [672]	13.81 [351]	27.81 [706]	11.56 [294]	13.63 [346]	51.44 [1307]	7.88 [200]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	324T	3.75 [95]	53.94 [1370]	31.75 [806]	53.19 [1351]	29.44 [748]	13.81 [351]	27.81 [706]	11.56 [294]	15.63 [397]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 6 x 5 x 8	254T-256T	3.75 [95]	47.50 [1207]	31.75 [806]	53.19 [1351]	23.13 [588]	13.81 [351]	26.25 [667]	11.56 [294]	12.00 [305]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]	12.38 [314]	5.50 [140]
	284T-286T	3.75 [95]	50.94 [1294]	31.75 [806]	53.19 [1351]	26.44 [672]	13.81 [351]	26.25 [667]	11.56 [294]	13.63 [346]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	324T	3.75 [95]	53.94 [1370]	31.75 [806]	53.19 [1351]	29.44 [748]	13.81 [351]	26.25 [667]	11.56 [294]	15.63 [397]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 8 x 6 x 12	326T	4.56 [116]	57.13 [1451]	41.31 [1049]	66.69 [1694]	29.44 [748]	15.00 [381]	30.75 [781]	13.56 [345]	15.63 [397]	64.94 [1650]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]	15.75 [400]	6.31 [160]
	364T-365T	4.56 [116]	61.38 [1559]	41.31 [1049]	66.69 [1694]	33.75 [857]	15.00 [381]	30.75 [781]	13.56 [345]	21.75 [552]	64.94 [1650]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		
	364TS-365TS	4.56 [116]	56.25 [1429]	41.31 [1049]	66.69 [1694]	28.56 [725]	15.00 [381]	30.75 [781]	13.56 [345]	16.56 [421]	64.94 [1650]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		
	404T-405T	4.56 [116]	62.13 [1578]	41.31 [1049]	66.69 [1694]	34.50 [876]	15.00 [381]	30.75 [781]	13.56 [345]	18.44 [468]	64.94 [1650]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		
	405TS	4.56 [116]	62.25 [1581]	41.31 [1049]	66.69 [1694]	34.63 [879]	15.00 [381]	30.75 [781]	13.56 [345]	18.44 [468]	64.94 [1650]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		

6.1 1750 RPM, continued

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 8 x 6 x 10	286T	4.56 [116]	51.75 [1314]	36.25 [921]	57.63 [1464]	26.44 [672]	15.00 [381]	30.75 [781]	11.56 [294]	13.63 [346]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]	15.75 [400]	6.31 [160]
	324T- 326T	4.56 [116]	53.94 [1370]	36.25 [921]	57.63 [1464]	29.44 [748]	15.00 [381]	30.75 [781]	11.56 [294]	15.63 [397]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
	364TS- 365TS	4.56 [116]	53.94 [1370]	36.25 [921]	57.63 [1464]	30.75 [780]	15.00 [381]	30.75 [781]	11.56 [294]	16.56 [421]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
	364T- 365T	4.56 [116]	59.00 [1499]	36.25 [921]	57.63 [1464]	33.75 [857]	15.00 [381]	30.75 [781]	11.56 [294]	21.75 [552]	55.88 [1419]	9.81 [249]	4.00 [102]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		
NL 8 x 6 x 8	254T- 256T	4.56 [116]	48.50 [1232]	41.31 [1049]	66.69 [1694]	23.13 [588]	15.00 [381]	30.75 [781]	13.56 [345]	12.00 [305]	64.94 [1649]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]	15.75 [400]	6.31 [160]
	284T- 286T	4.56 [116]	51.75 [1314]	41.31 [1049]	66.69 [1694]	26.44 [672]	15.00 [381]	30.75 [781]	13.56 [345]	13.63 [346]	64.94 [1649]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		
	324T	4.56 [116]	54.75 [1391]	41.31 [1049]	66.69 [1694]	29.44 [748]	15.00 [391]	30.75 [781]	13.56 [345]	15.63 [397]	64.94 [1649]	11.81 [300]	4.00 [102]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		

6.2 3500 RPM

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 2 1/2 x 1 1/2 x 8	213T- 215T	3.06 [78]	37.50 [954]	21.50 [547]	34.25 [869]	20.50 [521]	8.63 [220]	15.75 [400]	6.75 [171]	12.44 [315]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.06 [179]	3.94 [100]
	254T- 256T	3.75 [95]	42.75 [1087]	29.50 [750]	45.44 [1154]	24.13 [614]	10.56 [267]	14.63 [448]	8.06 [204]	15.56 [396]	45.25 [1150]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [374]	13.00 [330]	.88 [22]		
	284TS- 286TS	3.75 [95]	43.63 [1109]	29.50 [750]	45.44 [1154]	25.00 [363]	11.25 [286]	18.38 [466]	8.06 [204]	16.38 [415]	45.25 [1150]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [374]	13.00 [330]	.88 [22]		
	324TS	3.75 [95]	47.50 [1207]	31.75 [807]	51.63 [1311]	28.88 [733]	12.25 [311]	19.38 [491]	10.00 [254]	19.50 [495]	51.44 [1307]	9.88 [250]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 2 1/2 x 1 1/2 x 6	182T- 184T	2.63 [67]	34.31 [872]	21.00 [533]	33.38 [848]	16.50 [419]	7.56 [192]	13.88 [352]	6.44 [164]	8.44 [214]	32.81 [833]	5.88 [149]	2.38 [60]	14.88 [378]	13.13 [333]	10.94 [278]	.88 [22]	6.31 [160]	3.13 [79]
	213T- 215T	2.63 [67]	36.75 [934]	21.00 [533]	33.38 [848]	18.94 [481]	7.56 [192]	13.88 [352]	6.44 [164]	12.38 [315]	32.81 [833]	5.88 [149]	2.38 [60]	14.88 [378]	13.13 [333]	10.94 [278]	.88 [22]		
	254T- 256T	3.75 [96]	42.00 [1067]	29.50 [750]	44.63 [1134]	24.13 [614]	10.56 [267]	16.81 [427]	7.25 [184]	15.56 [396]	45.25 [1150]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284TS	3.75 [96]	42.44 [1077]	29.50 [750]	44.63 [1134]	24.56 [624]	11.25 [286]	17.56 [446]	7.25 [184]	16.38 [415]	45.25 [1150]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 2 1/2 x 2 x 8	215T	3.06 [78]	37.50 [954]	21.56 [548]	34.19 [868]	18.94 [481]	8.69 [221]	16.50 [420]	6.75 [171]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.88 [200]	3.94 [100]
	254- 256T	3.75 [95]	42.75 [1087]	29.50 [749]	45.44 [1154]	23.13 [588]	8.69 [221]	16.50 [420]	8.00 [204]	12.00 [305]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284TS- 286TS	3.75 [95]	43.63 [1109]	29.50 [749]	45.44 [1154]	25.00 [636]	11.25 [286]	19.13 [486]	8.00 [204]	13.63 [346]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	324TS- 326TS	3.75 [95]	45.31 [1151]	31.75 [806]	51.63 [1311]	26.69 [678]	12.00 [305]	19.88 [505]	10.00 [254]	14.63 [371]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 2 1/2 x 2 x 6	184T	3.06 [78]	35.13 [892]	21.56 [548]	34.19 [868]	16.50 [419]	8.69 [221]	15.75 [400]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.06 [179]	3.94 [100]
	213T- 215T	3.06 [78]	37.56 [954]	21.56 [548]	34.19 [868]	18.94 [481]	8.69 [221]	15.75 [400]	6.75 [171]	8.44 [214]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]		
	254T- 256T	3.75 [95]	42.75 [1087]	29.50 [749]	45.44 [1154]	23.13 [588]	10.56 [267]	17.63 [448]	8.00 [204]	10.00 [254]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284TS- 286TS	3.75 [95]	43.63 [1109]	29.50 [749]	45.44 [1154]	25.00 [636]	11.25 [286]	17.56 [446]	8.00 [204]	16.38 [415]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
NL 3 x 2 1/2 x 8	254T- 256T	3.75 [95]	42.75 [1087]	29.50 [749]	45.44 [1154]	24.13 [614]	11.25 [286]	20.19 [513]	8.06 [204]	12.00 [305]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	8.88 [225]	3.94 [100]
	284TS- 286TS	3.75 [95]	43.63 [1109]	29.50 [749]	45.44 [1154]	24.56 [624]	11.25 [286]	20.19 [513]	8.06 [204]	13.63 [346]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	324TS- 326TS	3.75 [95]	47.50 [1207]	31.75 [807]	51.63 [1311]	26.69 [678]	12.25 [311]	21.13 [536]	10.00 [254]	19.50 [495]	51.44 [1307]	9.81 [249]	4.25 [108]	18.38 [467]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS	3.75 [95]	49.50 [1258]	31.75 [807]	51.63 [1311]	30.88 [784]	13.25 [337]	22.13 [562]	10.00 [254]	20.69 [525]	51.44 [1307]	9.81 [249]	4.25 [108]	18.38 [467]	17.50 [445]	15.75 [400]	.88 [22]		

6.2 3500 RPM, continued

Pump Size	Motor Frame	A	L*	L3	L4	L5*	H3	H4	S1	HD*	L1	L2	Hb	B2	B3	B4	S4	H2	a
NL 3 x 2 1/2 x 6	213T-215T	3.06 [78]	37.56 [954]	21.56 [548]	34.19 [868]	18.94 [481]	8.69 [221]	16.56 [421]	6.75 [171]	10.00 [254]	33.38 [848]	5.88 [149]	2.38 [60]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	7.88 [200]	3.94 [100]
	254T-256T	3.75 [95]	42.75 [1087]	29.50 [749]	45.44 [1154]	24.13 [614]	11.25 [286]	18.31 [465]	8.06 [204]	12.00 [305]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284TS-286TS	3.75 [95]	43.63 [1109]	29.50 [749]	45.44 [1154]	24.56 [624]	11.25 [286]	19.13 [486]	8.06 [204]	13.63 [346]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	324TS	3.75 [95]	47.50 [1207]	31.75 [807]	51.63 [1311]	30.44 [773]	12.25 [311]	20.19 [513]	10.00 [254]	19.50 [495]	51.44 [1307]	9.81 [249]	4.25 [108]	18.38 [467]	17.50 [445]	15.75 [400]	.88 [22]		
NL 4 x 3 x 8	256T	3.75 [95]	47.06 [1195]	29.50 [749]	46.44 [1180]	23.19 [588]	11.06 [281]	20.94 [532]	9.00 [229]	16.38 [415]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	9.81 [249]	4.94 [125]
	284TS-286TS	3.75 [95]	48.50 [1232]	29.50 [749]	46.44 [1180]	24.56 [624]	11.06 [281]	20.94 [532]	11.00 [279]	19.50 [495]	45.25 [1149]	7.88 [200]	4.00 [102]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	324TS-326TS	3.75 [95]	50.63 [1286]	31.75 [806]	52.63 [1337]	26.69 [678]	12.25 [311]	22.13 [562]	11.00 [279]	20.75 [525]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS-365TS	3.75 [95]	52.50 [1333]	31.75 [806]	52.63 [1337]	30.75 [780]	13.25 [337]	23.13 [587]	11.00 [279]	21.75 [552]	51.44 [1307]	9.81 [249]	4.00 [102]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	405TS	4.56 [116]	58.13 [1477]	36.25 [920]	56.25 [1429]	34.25 [869]	14.25 [362]	24.06 [612]	10.19 [259]	23.00 [583]	55.93 [1420]	9.81 [249]	4.00 [102]	22.06 [561]	20.63 [524]	17.56 [446]	.88 [22]		
NL 4 x 3 x 6	213T-215T	3.06 [78]	38.56 [980]	21.56 [548]	35.19 [894]	18.94 [481]	9.44 [238]	18.31 [465]	7.75 [197]	10.00 [254]	33.38 [848]	5.88 [149]	4.25 [108]	18.38 [467]	16.63 [422]	14.44 [367]	.88 [22]	8.88 [225]	4.94 [125]
	254T-256T	3.75 [95]	42.75 [1087]	29.50 [749]	46.44 [1180]	23.19 [588]	11.06 [281]	20.19 [513]	9.00 [229]	15.63 [397]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	284TS-286TS	3.75 [95]	43.63 [1109]	29.50 [749]	46.44 [1180]	24.56 [624]	11.06 [281]	20.19 [513]	9.00 [229]	16.38 [415]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]		
	324TS-326TS	3.75 [95]	47.50 [1207]	31.75 [806]	52.63 [1337]	26.69 [678]	12.25 [311]	21.13 [536]	11.00 [279]	19.50 [495]	51.44 [1307]	9.81 [249]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS	3.75 [95]	49.50 [1258]	31.75 [806]	52.63 [1337]	30.75 [780]	13.25 [337]	22.13 [525]	11.00 [279]	20.75 [525]	51.44 [1307]	9.81 [249]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
NL 5 x 4 x 8	286TS	3.75 [95]	49.00 [1244]	29.50 [749]	46.44 [1180]	25.00 [636]	11.88 [302]	22.88 [581]	9.00 [229]	13.63 [346]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	11.00 [279]	4.94 [125]
	324TS-326TS	3.75 [95]	51.13 [1298]	31.75 [806]	52.63 [1337]	26.69 [678]	12.25 [311]	23.25 [591]	11.00 [279]	19.50 [495]	51.44 [1307]	9.81 [249]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS-365TS	3.75 [95]	52.50 [1333]	31.75 [806]	52.63 [1337]	30.75 [780]	13.25 [337]	24.31 [617]	11.00 [279]	20.75 [525]	51.44 [1307]	9.81 [249]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	404TS-405TS	4.56 [116]	58.13 [1477]	36.25 [921]	56.25 [1429]	34.25 [869]	14.25 [362]	26.25 [642]	11.00 [279]	21.75 [552]	55.93 [1420]	9.81 [249]	4.25 [108]	22.06 [561]	20.63 [524]	17.56 [446]	.88 [22]		
	445TS	4.56 [116]	64.38 [1636]	41.31 [1049]	65.31 [1659]	40.50 [1029]	15.25 [387]	26.25 [667]	12.19 [309]	23.00 [583]	65.00 [1650]	11.81 [300]	4.25 [108]	24.44 [621]	23.00 [584]	21.25 [540]	.88 [22]		
NL 5 x 4 x 6	286TS	3.75 [95]	49.00 [1244]	29.50 [749]	46.44 [1180]	25.00 [636]	11.88 [302]	22.88 [581]	9.00 [229]	13.63 [346]	45.25 [1149]	7.88 [200]	4.25 [108]	16.19 [411]	14.75 [375]	13.00 [330]	.88 [22]	11.00 [279]	4.94 [125]
	324TS-326TS	3.75 [95]	51.13 [1298]	31.75 [806]	52.63 [1337]	26.69 [678]	12.25 [311]	23.25 [591]	11.00 [279]	19.50 [495]	51.44 [1307]	7.88 [200]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	364TS-365TS	3.75 [95]	52.50 [1333]	31.75 [806]	52.63 [1337]	30.75 [780]	13.25 [337]	24.31 [617]	11.00 [279]	20.75 [525]	51.44 [1307]	7.88 [200]	4.25 [108]	18.94 [481]	17.50 [445]	15.75 [400]	.88 [22]		
	405TS	4.56 [116]	58.13 [1477]	36.25 [921]	56.25 [1429]	34.25 [869]	14.25 [362]	26.25 [642]	10.19 [259]	21.75 [552]	55.93 [1420]	7.88 [200]	4.25 [108]	22.06 [560]	20.63 [524]	17.56 [446]	.88 [22]		

7 Typical Specifications for NL (End Suction) Series Base Mounted, Flexible Coupled Pumps

Furnish and install pumps with performance characteristics as shown on plans. Pumps shall be base mounted, single stage, end suction design with a foot mounted volute to allow removal and service of the entire rotating assembly without disturbing the pump piping, electrical motor connections.

Pump volute shall be Class 30 cast iron with integrally-cast pedestal support feet. The impeller shall be cast bronze enclosed type, balanced to ANSI/HI 1.1-1.5-1994, section 1.4.6.1.3.1, figure 1.106, balance grade G6.3 and keyed to the shaft and secured by a locking capscrew.

The liquid cavity shall be sealed off at the pump shaft by an internally-flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation at 220°F (105°C).

Pump shall be rated for minimum of 175 psi (12 bar) working pressure. Volute shall have gauge tappings at the suction and discharge nozzles and vent and drain tappings at the top and bottom.

The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 1.1-1.5-1994, section 1.4.6.1.1 for recommend acceptable unfiltered field vibration limits (as measured per HI 1.4.6.5.2, Figures 1.108) for pumps with rolling contact bearings.

Baseplate shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members. Grouting area shall be fully open. The combined pump and motor baseplate shall be sufficiently stiff as to limit the susceptibility of vibration. The minimum baseplate stiffness shall conform to ANSI/HI 1.3.4-1997 for Horizontal Baseplate Design standards.

The seismic capability of the pump shall allow it to withstand a horizontal load of 0.5g, excluding piping and/or fasteners used to anchor the pump to mounting pads or to the floor, without adversely affecting pump operation.

A flexible type, center drop-out design coupler, capable of absorbing torsional vibration, shall be employed between the pump and motor. Pumps for variable speed application shall be provided with a suitable coupler sleeve (Consult Factory). The coupling shall be shielded by a dual rated ANSI B15.1, Section 8 & OSHA 1910.219 compliant coupling guard and contain viewing windows for inspection of the coupling.

Motor shall meet NEMA and EPACT '92 (where applicable) specifications and shall be of the size, voltage and enclosure called for on the plans. Pump and motor shall be factory aligned, and shall be realigned by the contractor per factory recommendations after installation.

The pump(s) selected shall conform to ANSI/HI 9.6.3.1 standards for Preferred Operating Region (POR) unless otherwise approved by the engineer. The pump NPSH shall conform to the ANSI/HI 9.6.1-1997 standards for Centrifugal and Vertical Pumps for NPSH Margin.

Each pump shall be factory hydrostatically tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high grade paint prior to shipment.

The pump(s) shall be manufactured, assembled and tested in an ISO 9001 approved facility.

Pumps shall be NL (End Suction) Series as manufactured by Wilo.

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