CAST IRON ASPHALT PUMPS
JACKETED ROTARY POSITIVE DISPLACEMENT PUMPS
230 Series™

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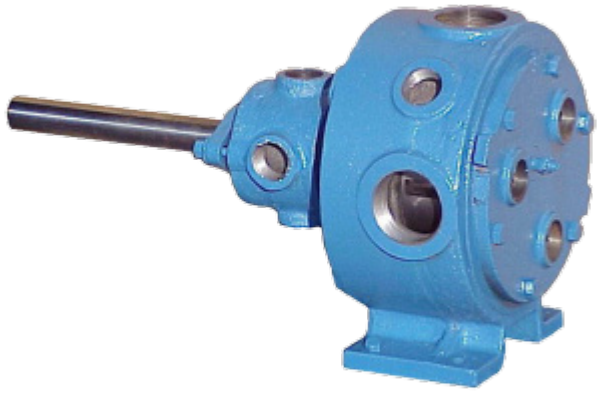
RELATED PRODUCTS

Cast Iron, Non-Jacketed Pumps: Catalog Section 1444

Cast Iron, Jacketed Pumps: Catalog Section 1464

SERIES DESCRIPTION

- Designed to handle heavy, viscous liquid requiring temperature control to maintain a flowing state
- Supplied with standard jacketed casing, and optional jacketed head, jacketed rotor bearing sleeve and jacketed relief valve
- Packing gland is multi-ring and can be supplied with special packing for high temperature conditions when required.
- Typical applications include pumping asphalt, pitch, molten sulfur, fluids that require heating to be in a liquid state.



MODEL NUMBER KEY

K K - 2 3 0

Size:
KK LQ Q M N

Basic Series Configuration

OPERATING RANGE

SERIES	MAXIMUM CAPACITY		MAXIMUM PRESSURE		MAXIMUM TEMPERATURE		MAXIMUM VISCOSITY	
	USGPM	l/min	PSI	kPa	°F	°C	SSU	cSt
230 Series™	to 480	to 1,817	100	690	to +650	to +343	to 2,000,000	to 440,000

* Consult factory for viscosities exceeding the stated operating range

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CAST IRON ASPHALT PUMPS

JACKETED ROTARY POSITIVE DISPLACEMENT PUMPS

230 Series™

FEATURES & BENEFITS

- **Jacketed Relief Valve:**
  To protect against excessive pressures, a jacketed relief valve can be supplied as an optional feature on all models. Jacketed relief valves can only be supplied with standard non-jacketed heads.
- **Jacketed Casing:**
  Supplied as standard for all models. Casings are furnished in right hand port construction, as standard, left hand position can be supplied as an optional feature. All casings are supplied with tapped connections to accommodate heating or cooling.
- **Drive Arrangements:**
  Pumps can be easily adapted to various v-belt, direct and gear reduction drive arrangements to suit. The pump shaft is supported by anti-friction bearing pillow block permitting smooth and quiet operation.
- **Self-Priming:**
  The pumps are self-priming in a period of seconds, under normal operating conditions. They possess excellent vacuum developing characteristics.
- **Sealing Method:**
  These pumps are supplied with multi-ring packing to reduce possible leaks to absolute minimum. They can be supplied with special packing for high temperature applications. Mechanical and lip seals are also available as an optional feature.
- **Jacketed Head & Rotor Bearing Sleeve:**
  Available as optional equipment, and are supplied with tapped connections to accommodate heating or cooling lines.

JACKET RATINGS

Jacket Ratings	Max. Temp		Max. Pressure	
	°F	°C	PSI	kPa
Saturated Steam	365	185	150	1034
Hot Oil	650	343	150	1034

STANDARD MATERIALS OF CONSTRUCTION

Component	Standard Material
Casing ①	Iron
Head ②	Iron
Rotor Bearing Sleeve ③	Iron
Rotor ④	Iron
Idler	Iron
Rotor Shaft	Steel
Idler Pin	Steel
Idler & Bracket Bushing ⑤	Bronze (Carbon Graphite Optional)
Shaft Seal ⑥ ⑦	Packed
Integral Relief Valve ⑧	Iron

① Jacketed casing standard on 230 Series™ pumps

② Non-jacketed head with integral relief valve is standard. Jacketed head is available as an option. A combination of jacketed head and non-jacketed or jacketed relief valve is not available.

③ Jacketed rotor bearing sleeve is available as an option.

④ Ductalloy rotor is standard on M-230 and N-230 pumps.

⑤ Other bushings available to suit application

⑥ Standard packing is C-1065 graphite/PTFE.

⑦ Mechanical seals are available. Buna is standard elastomer. FKM and PTFE elastomers are available upon request.

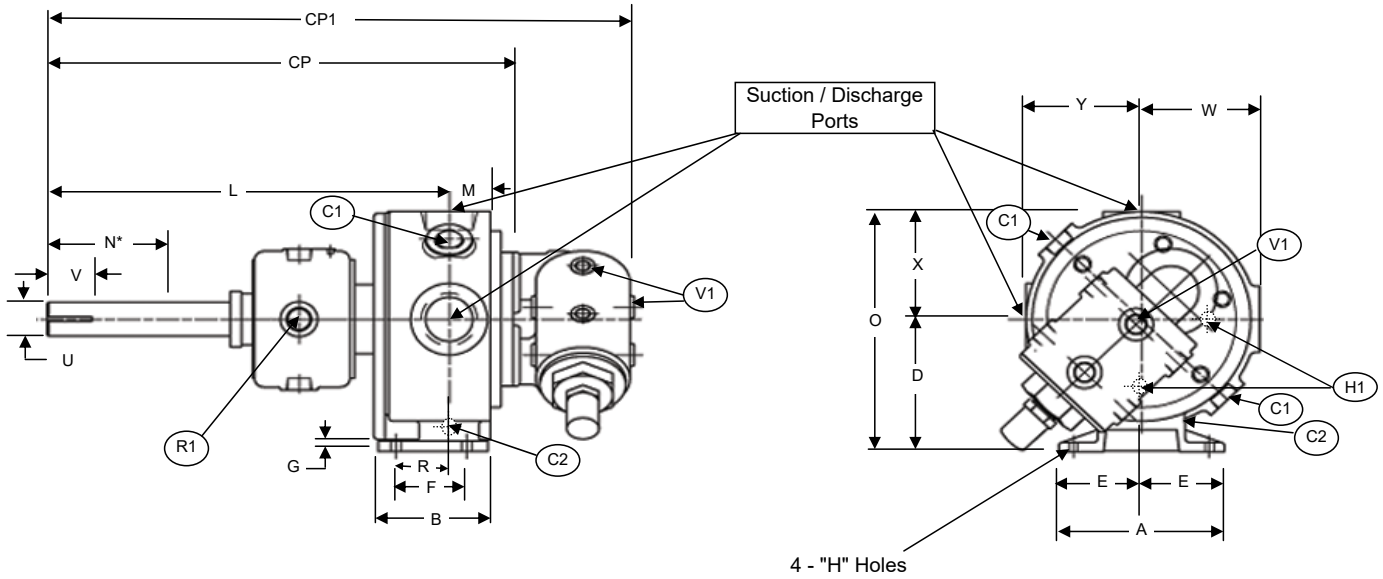
⑧ All iron non-jacketed relief valve is standard on 230 Series™. Jacketed relief valve is available as an option. A combination of jacketed head and non-jacketed or jacketed relief valve is not available.

SPECIFICATIONS

Model Number	Standard Ports	Nominal Pumping Rating at 50 PSI (345 kPa) 100 SSU (21 cSt)			Motor Power Required Based on Rated Speed 100 SSU (21 cSt)				Maximum Hydrostatic Pressure		Maximum Rec. Discharge Pressure Over 21 cSt (100 SSU)		Maximum Recommended Temperature* Packed		Approximate Shipping Weight	
					50 PSI (345 kPa)		100 PSI (690 kPa)									
	Inch	GPM	LPM	RPM	HP	kW	HP	kW	PSI	kPa	PSI	kPa	F	C	LBS	KG
KK-230	2" NPT	55	208	420	2.30	1.72	4.70	3.51	400	2758	100	690	450	232	100	46
LQ-230	3" Flanged	94	356	420	3.80	2.83	7.80	5.82	400	2758	100	690	450	232	140	64
Q-230	4" Flanged	205	776	350	10.00	7.46	—	—	400	2758	75	517	450	232	410	186
M-230	5" Flanged	290	1,098	280	13.70	10.22	—	—	400	2758	75	517	450	232	666	302
N-230	5" Flanged	480	1,817	280	21.00	15.67	—	—	400	2758	75	517	450	232	790	359

* For higher temperatures, consult factory for recommendations.

DIMENSIONS



These dimensions are average and not for construction purposes. Certified prints on request.

Model Number	Port Size		A	B	CP	CP1	D	E	F	G	H	L	M	N	O	P	R
KK-230	2" NPT	in	7.0	4.63	20.25	27.25	6.0	2.88	3.0	.50	.41	17.00	1.75	7.75	10.88	.75	2.25
		mm	178	118	514	692	152	73	76	13	10	432	44	197	276	19	57
LQ-230	3" Flanged	in	7.0	4.63	25.75	30.63	6.0	3.44	3.0	.50	.47	21.63	2.0	10.75	13.19	.75	2.0
		mm	178	118	654	778	152	87	76	13	12	549	51	273	335	19	51
Q-230	4" Flanged	in	10.0	6.50	36.88	44.63	7.75	4.13	4.25	.63	.66	31.0	3.0	17.0	16.63	.88	2.88
		mm	254	165	937	1134	197	105	108	16	17	787	76	432	422	22	73
M-230	5" Flanged	in	12.0	8.50	31.38	39.38	9.5	5.0	6.25	.75	.66	24.50	4.5	11.50	19.0	.81	3.38
		mm	305	216	797	1000	241	127	159	19	17	622	114	292	483	21	86
N-230	5" Flanged	in	12.0	8.50	35.38	43.38	9.5	5.0	6.25	.75	.66	28.50	4.5	9.50	19.0	.81	3.38
		mm	305	216	899	1102	241	127	159	19	17	724	114	241	483	21	86

Model Number		U	V	W	X	Y	Keyway	No. and Pipe Size of Jacket Connection					Approximate Shipping Weight
								Casing		Head	RV	RBS	
								C1	C2	H1	V1	R1	
KK-230	in	1.13	2.0	5.0	4.88	4.88	.250 x .125	2 x 1"	N/A	3 x ½"	5 x 1"	2 x ½"	100 lb
	mm	29	51	127	124	124	6 x 3						45.5 kg
LQ-230	in	1.44	2.0	5.75	7.19	7.19	.375 x .188	2 x 1½"	N/A	3 x ½"	5 x 1"	4 x ½"	140 lb
	mm	37	51	146	183	183	10 x 5						63.5 kg
Q-230	in	1.94	3.0	7.75	8.88	8.88	.500 x .250	2 x 1½"	N/A	4 x 1"	6 x 1"	4 x 1"	410 lb
	mm	49	76	197	226	226	13 x 6						186 kg
M-230	in	1.94	3.0	9.63	10.00	10.00	.500 x .250	2 x 2"	2 x 1½"	4 x 1¼"	6 x 1"	4 x 1"	666 lb
	mm	49	76	245	241	241	13 x 6						302 kg
N-230	in	2.44	3.0	9.63	10.00	10.00	.625 x .313	2 x 2"	2 x 1½"	4 x 1¼"	6 x 1"	4 x 1¼"	790 lb
	mm	62	76	245	241	241	16 x 8						359 kg

Note: A combination of Jacketed Head and Jacketed or Non-Jacketed Relief Valve is not available.

Note: Flanged ports are acceptable for use with 125# ANSI companion flanges and fittings.

N* - Length of Shaft available for repacking.

PERFORMANCE CURVES

Inlet Conditions

The performance curves show “Based on 10 (or 15) in – Hg.” Which is the standard test condition. This is not the maximum vacuum capability of the pump.

Extra Clearances

Extra clearances are required for higher viscosities as noted on the performance curves to reduce horsepower requirements and provide smooth pump operation. Extra clearances may also be required at elevated temperature.

Mechanical Efficiency

The mechanical efficiency (expressed in percent) can be calculated using the following formula:

Relief Valves

Almost all pumps are equipped with internal relief valves to protect the pumps and systems from over pressure. These valves are not designed to operate as capacity regulating devices. The maximum differential operating pressure should be specified when then pump is ordered to ensure that the spring or springs will be capable of covering the required pressure range. Relief valves should be set at “complete bypass pressure” where the entire capacity of the pump is bypassing through the relief valve. The relationship between “cracking pressure” and “complete bypass pressure” varies depending on the pump and the application. Final setting of the valve should be made when the pump is installed and operating. If the relief valve is used strictly as an overpressure device for unusual circumstances, the motor can be selected based on operating pressures. This assumes proper motor protection has been installed and a delay to reset is acceptable. If frequent full opening of the relief valve is required in the application, the motor should be sized to cover or nearly cover the complete bypass setting.

NPSH (Net Positive Suction Head)

The $NPSH_R$ (Net Positive Suction Head Required by the pump) is given in the table below and applies for viscosities through 750 SSU. $NPSH_A$ (Net Positive Suction Head – Available in the system) must be greater than the $NPSH_R$.

PUMP SIZE	PUMPS SPEED, RPM														
	100	125	155	190	230	280	350	420	520	640	780	950	1150	1450	1750
HX4	—	—	—	—	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
KK	—	—	1.8	1.9	2.1	2.3	2.8	3.3	4.4	6.3	9.1	—	—	—	—
LQ	1.7	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
Q	1.9	2.1	2.3	2.7	3.3	4.2	6.1	8.4	12.7	—	—	—	—	—	—
M	2.1	2.3	2.8	3.4	4.3	6.0	9.0	12.7	—	—	—	—	—	—	—
N	2.1	2.3	2.8	3.4	4.3	6.0	9.0	—	—	—	—	—	—	—	—

$NPSH_R$ – FEET OF LIQUID (Specific Gravity 1.0), Viscosities up to 750 SSU

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JACKETED ROTARY POSITIVE DISPLACEMENT PUMPS

230 Series™

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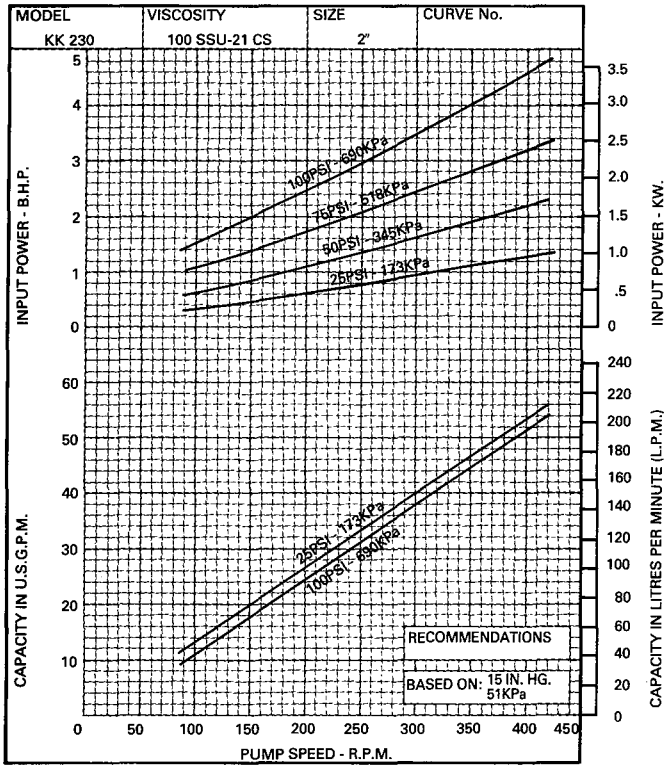
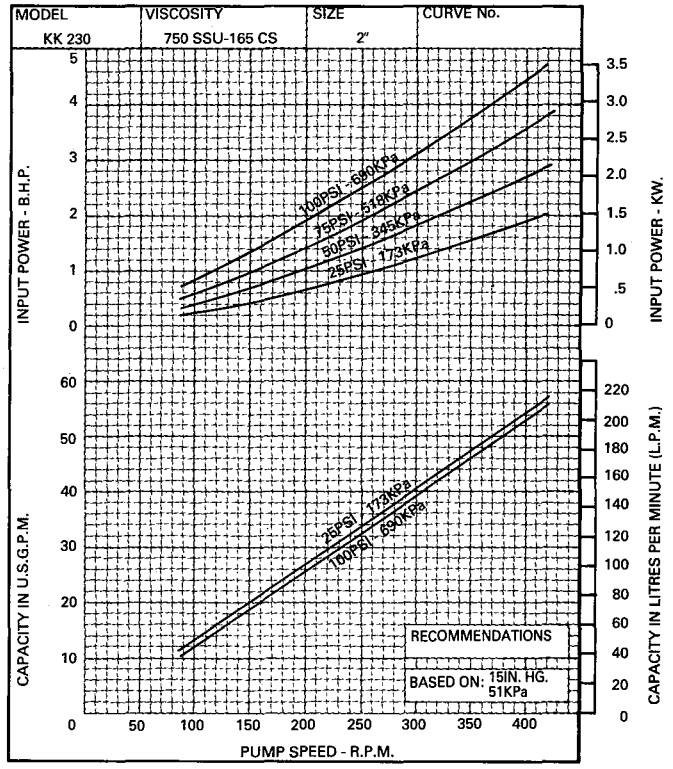
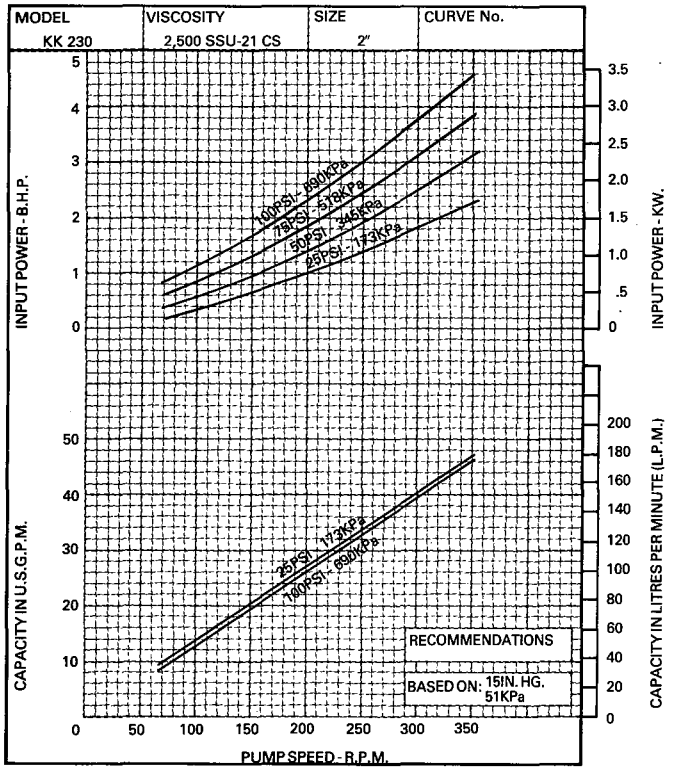
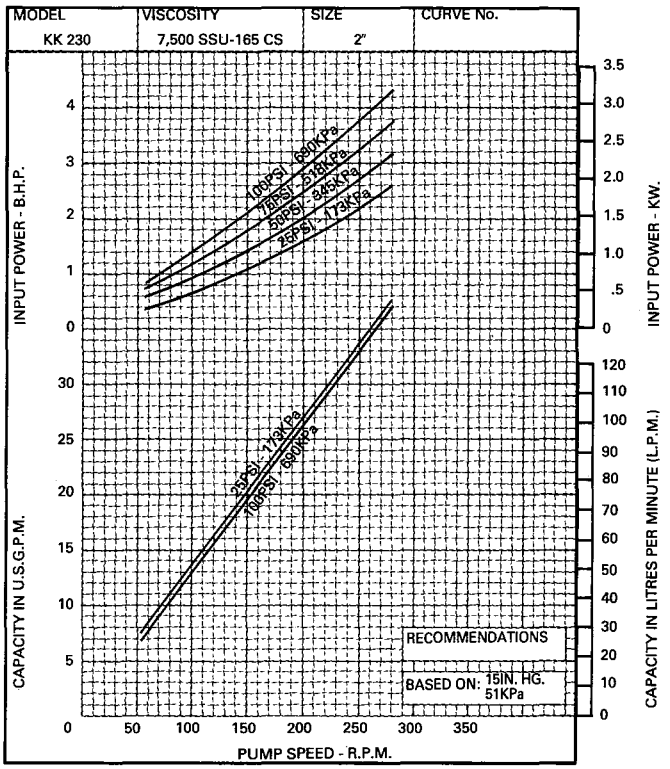
KK SIZE







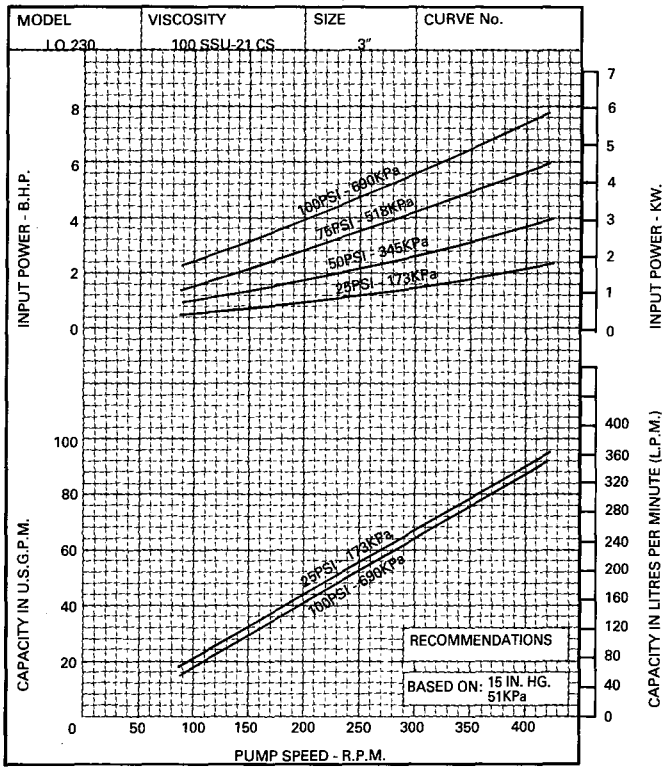


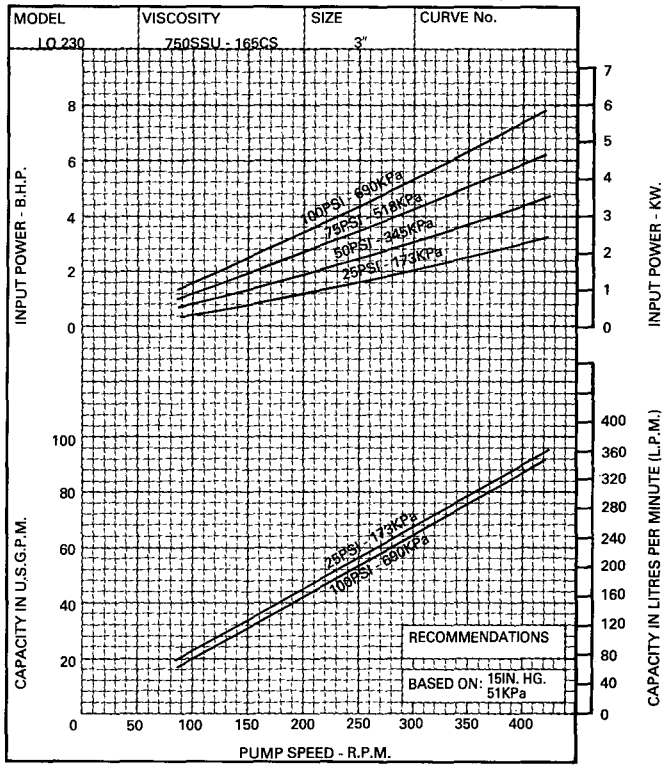
CAST IRON ASPHALT PUMPS

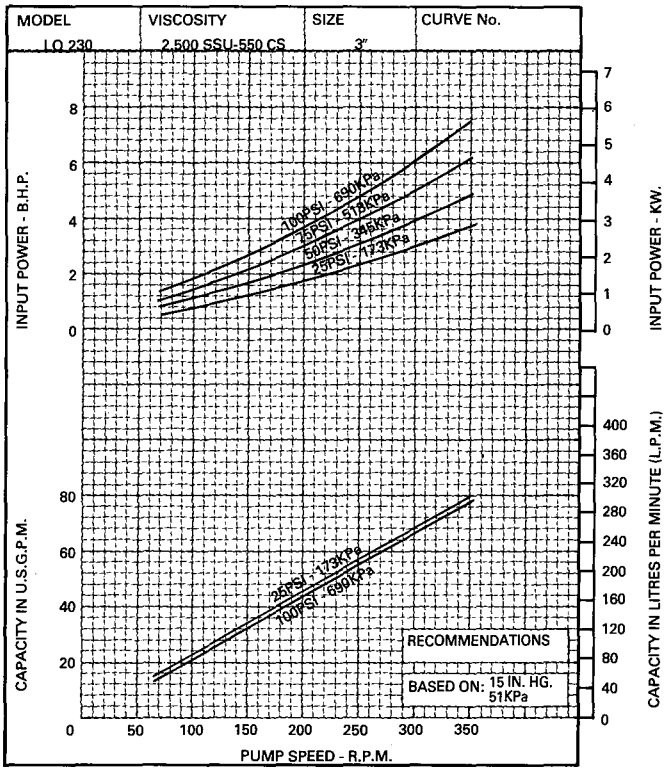
JACKETED ROTARY POSITIVE DISPLACEMENT PUMPS

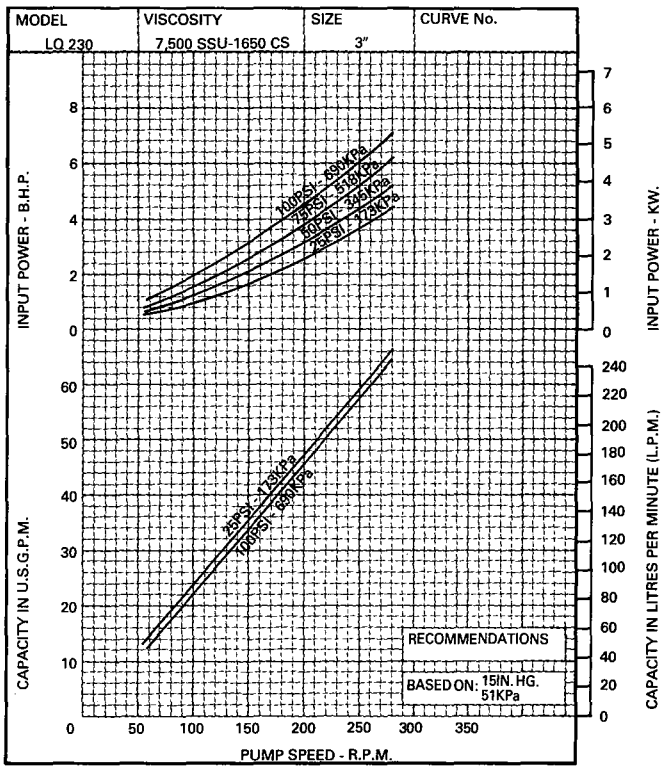
230 Series™

LQ SIZE

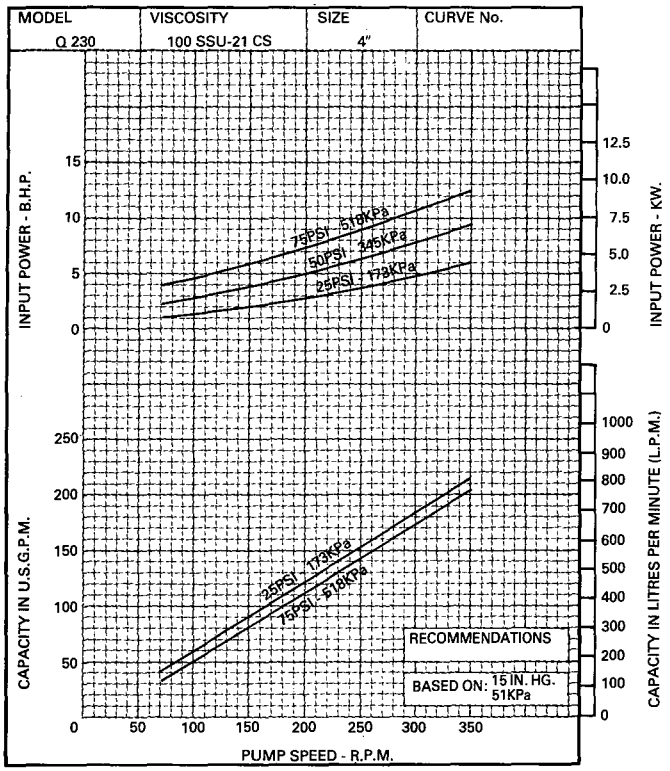


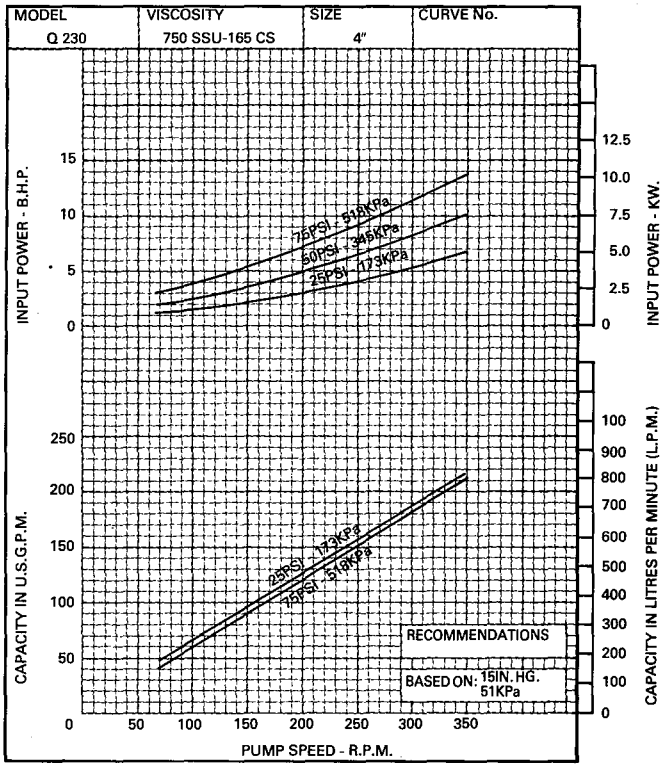






Q SIZE


MODEL
Q 230
VISCOSITY
100 SSU-21 CS
SIZE
4"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
25PSI - 173KPa
75PSI - 518KPa
RECOMMENDATIONS
BASED ON: 15 IN. HG.
51KPa
PUMP SPEED - R.P.M.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Q 230
VISCOSITY
750 SSU-165 CS
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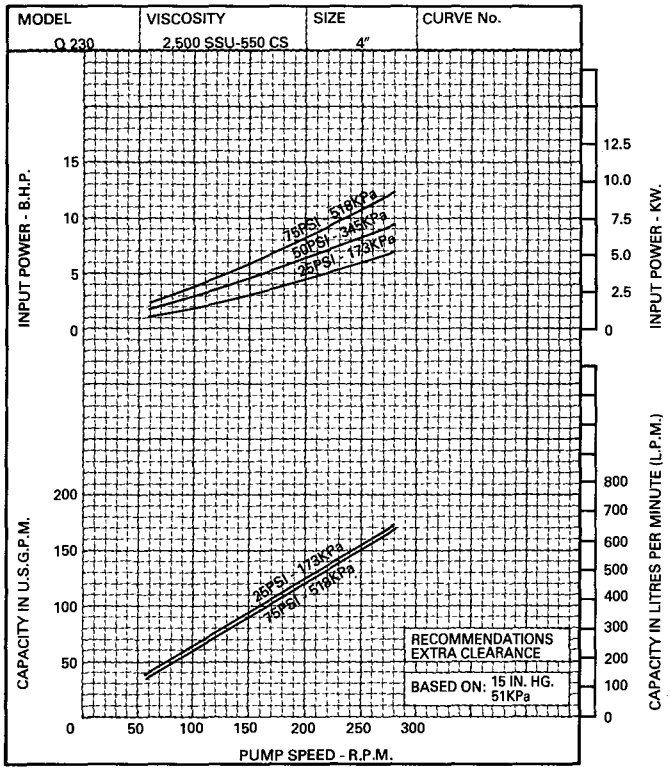
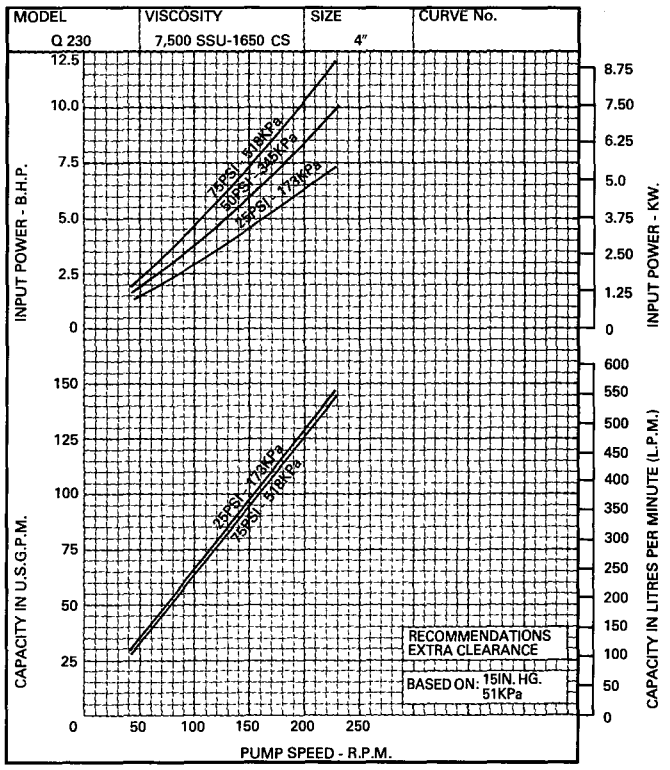
4"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
25PSI - 173KPa
75PSI - 518KPa
RECOMMENDATIONS
BASED ON: 15IN. HG.
51KPa
PUMP SPEED - R.P.M.


MODEL
Q 230
VISCOSITY
2,500 SSU-550 CS
SIZE
4"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
25PSI - 173KPa
75PSI - 518KPa
RECOMMENDATIONS
EXTRA CLEARANCE
BASED ON: 15 IN. HG.
51KPa
PUMP SPEED - R.P.M.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VISCOSITY
7,500 SSU-1650 CS
SIZE
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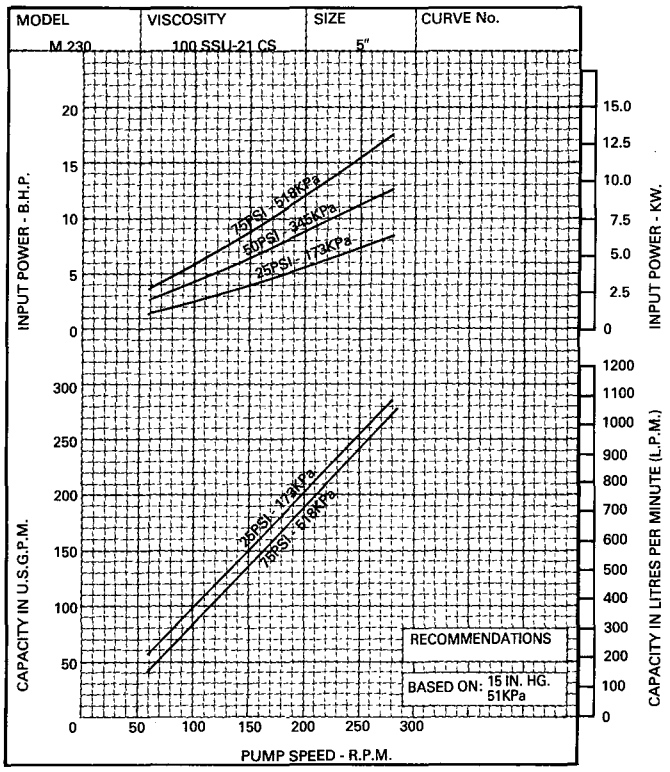
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
25PSI - 173KPa
75PSI - 518KPa
RECOMMENDATIONS
EXTRA CLEARANCE
BASED ON: 15IN. HG.
51KPa
PUMP SPEED - R.P.M.

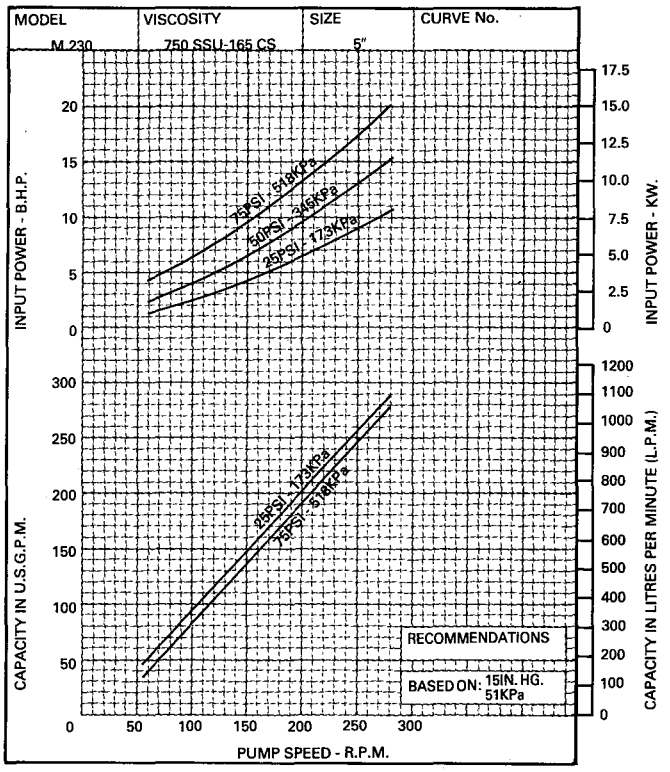
CAST IRON ASPHALT PUMPS

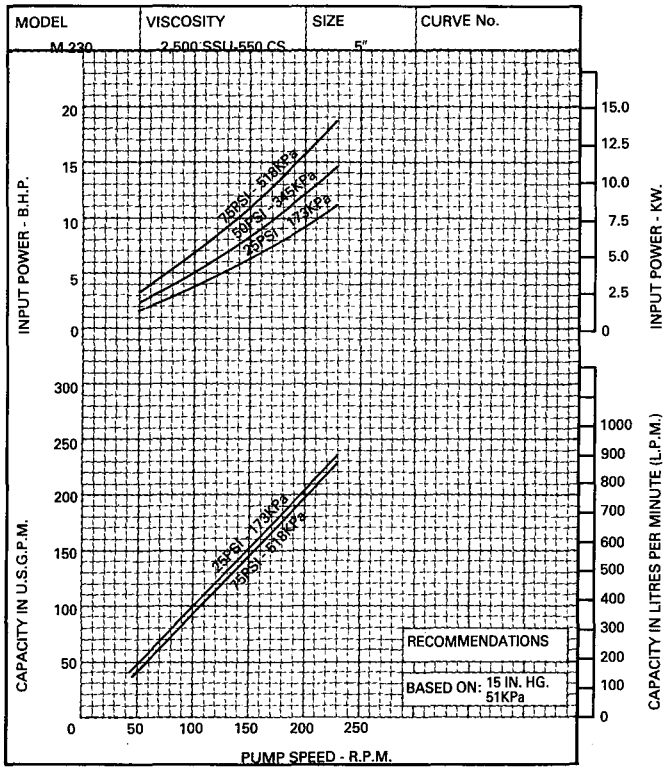
JACKETED ROTARY POSITIVE DISPLACEMENT PUMPS

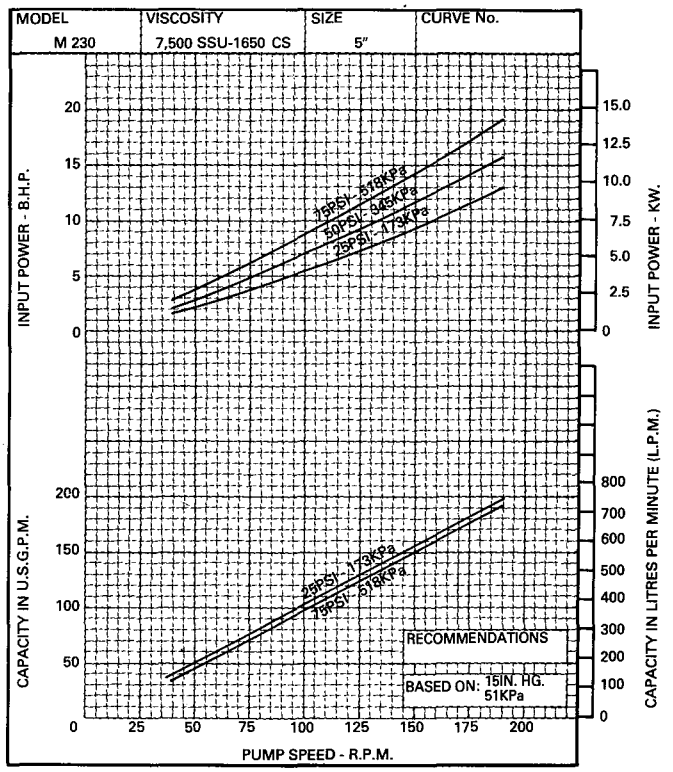
230 Series™

M SIZE

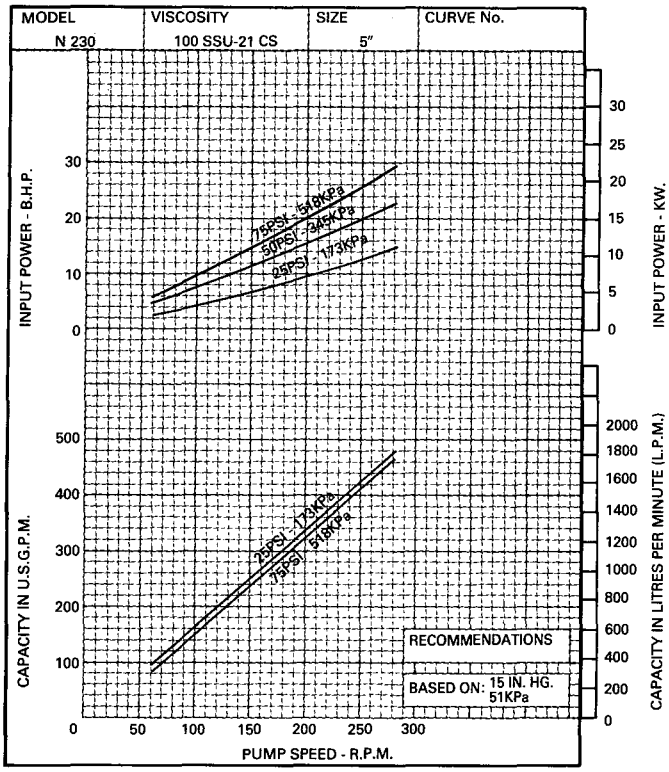








N SIZE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N 230
VISCOSITY
100 SSU-21 CS
SIZE
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CURVE No.
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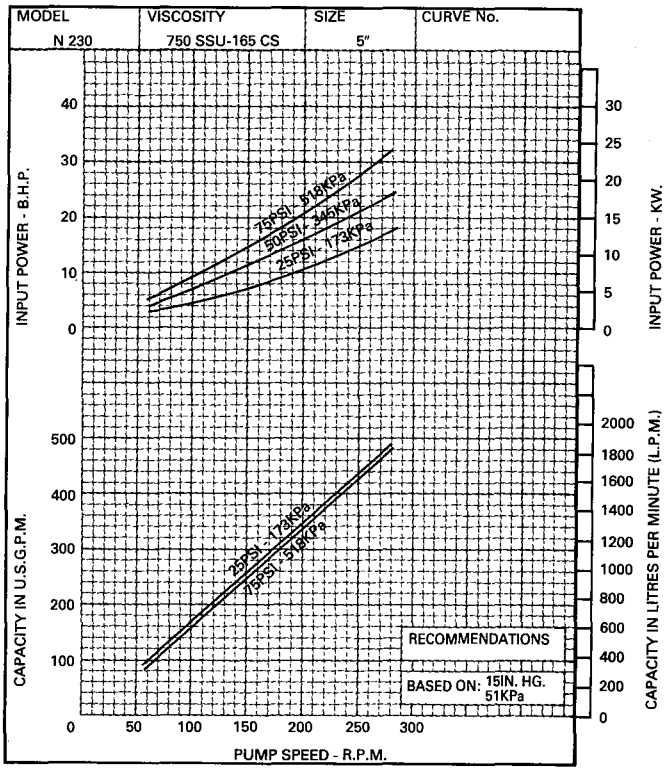
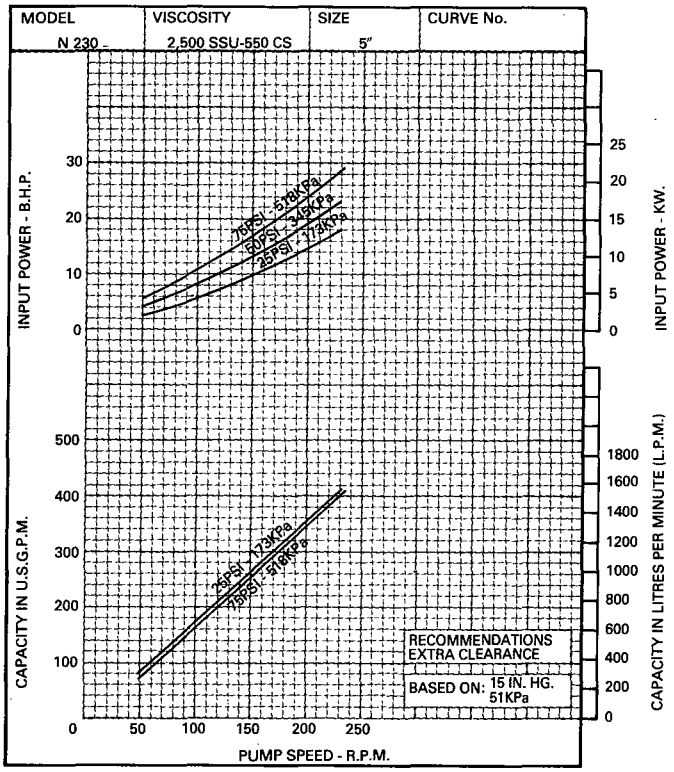
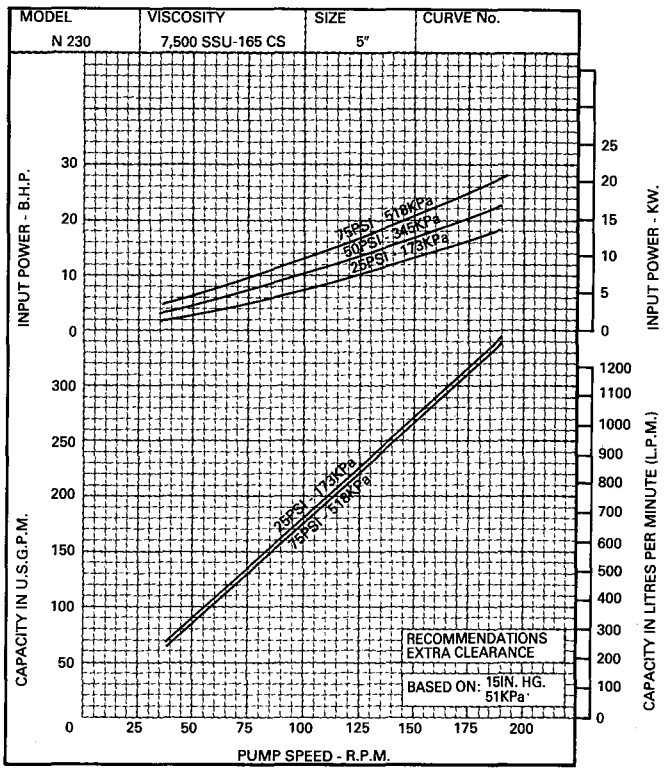
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
RECOMMENDATIONS
BASED ON: 15 IN. HG. 51KPa
PUMP SPEED - R.P.M.


MODEL
N 230
VISCOSITY
750 SSU-165 CS
SIZE
5"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
RECOMMENDATIONS
BASED ON: 15IN. HG. 51KPa
PUMP SPEED - R.P.M.


MODEL
N 230
VISCOSITY
2,500 SSU-550 CS
SIZE
5"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
RECOMMENDATIONS
EXTRA CLEARANCE
BASED ON: 15 IN. HG. 51KPa
PUMP SPEED - R.P.M.


MODEL
N 230
VISCOSITY
7,500 SSU-165 CS
SIZE
5"
CURVE No.
INPUT POWER - B.H.P.
INPUT POWER - KW.
CAPACITY IN U.S.G.P.M.
CAPACITY IN LITRES PER MINUTE (L.P.M.)
75PSI - 518KPa
50PSI - 345KPa
25PSI - 173KPa
RECOMMENDATIONS
EXTRA CLEARANCE
BASED ON: 15IN. HG. 51KPa
PUMP SPEED - R.P.M.