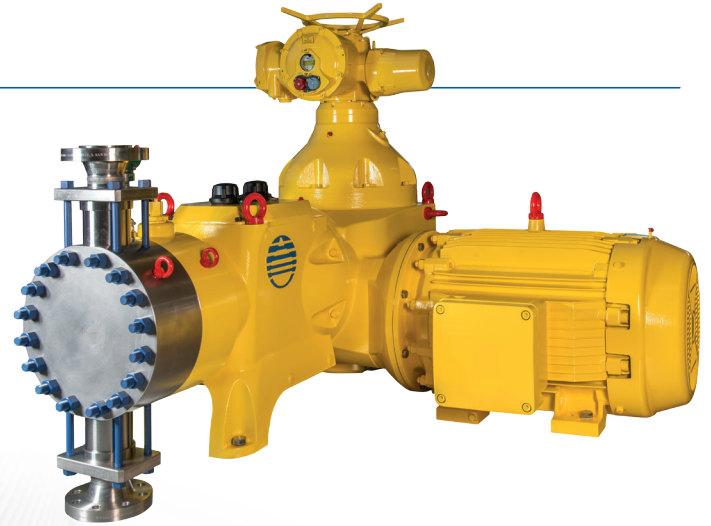


# PRIMEROYAL® X

## Metering Pump

### Model X

PRIMEROYAL X metering pump is a versatile, reliable pump that consistently and accurately injects chemicals. This API675-compliant pump has been designed to deliver maximum performance within a minimized footprint. The pump provides accurate dosing of a broad spectrum of fluids at pressures up to 1,379 bar (20,000 psig) and a maximum flow rate of up to 8,647 l/h (2,284 gph). Available in vertical or horizontal motor configurations and with ability to accommodate three types of liquid ends, Primeroyal X can meet the specific performance requirements of numerous industrial applications.



### Applications

- Oil and Gas
  - Upstream – injection of methanol, monoethylene glycol, corrosion inhibitors and many more to prevent hydrate formation, wax and scale deposits and corrosion in deepwater wells
  - Midstream – Injection of corrosion inhibitors for produced oil and gas integrity during transportation
  - Downstream – Injection of chemicals for separation and treatment of refined products
  - Produced water treatment – Injection of sodium hypochlorite, biocides, scale inhibitors, oxygen reducing agent, etc.
- Chemical and Petrochemical Processing
  - Dosing catalysts for polymerization of polyethylene
- Power Generation
  - High-pressure boiler feed water treatment

### Features and Benefits

- Compliant with API675 standards
- Higher pressures and flow ranges
- Available in vertical or horizontal motor configurations
- Manual or electrical stroke length adjustment
- Capacity adjustable while running or stopped
- Minimized footprint
- Packed plunger, Teflon® PTFE or metallic double diaphragm liquid ends available
- Conforms to ATEX CE EX II 2G/D c T3 with ATEX motors
- Multiplexable

### General Specifications

Accuracy	± 1% over a range of 10 to 100% nominal flowrate
Flow rate adjustment	Micrometer adjustment of stroke while running or stopped
Maximum stroke	120 mm (4.72 in)
Frequencies at 50 Hz 1,440 rpm	73, 93, 117, 146 and 175 spm
Frequencies at 60 Hz 1,725 rpm	88, 112, 140, and 175 spm
Thrust	6,000 daN (13,489 lbf)
API675	Conforms (exemptions available upon request)
ATEX	Conforms to ATEX CE EX II 2G/D c T3 with ATEX and NEMA motors

## Design Specifications

	Liquid End					
	Packed Plunger		Double Metallic Diaphragm		Double PTFE Diaphragm	
	Type NX		Type MX		Type HX	
Maximum flow rate and pressure	1,268 l/h 980 bar	335 gph 14,214 psi	1,980 l/h 1,372 bar	523 gph 19,899 psi	8,647 l/h 252 bar	2,285 gph 3,655 psi
Suction lift	6 m (19.7 ft) water		2 m (6.57 ft) water		4 m (13 ft) water	
Limit temperature of fluid pumped	-10°C to 95°C	14°F to 203°F	-40°C to 60°C	-40°F to 140°F	-10°C to 95°C	14°F to 203°F
Liquid end body	17.4 PH Ø40 = 316L		17.4 PH		316L	
Plunger material	A1203 (ceramic)		N/A		N/A	
Diaphragm material	N/A		301		PTFE	
Check valve cartridge	316L		P < 689 bar (10,000 psi) : 316L P ≥ 689 bar (10,000 psi) : 17.4 PH		316L	
Seats	17.4 PH		13.8 PH		316L	
Balls	440C		Al <sub>2</sub> O <sub>3</sub> (ceramic)		flat valves = 17.4 PH	
Seals	Viton		Nitrile		PTFE	
Retaining rings	316L		NA		316L	

## Design Specifications

### Model PX with Plunger Liquid End Type NX

Flow rate		Pressure Max. 50 Hz Motor (kW)						Freq. (spm)	Motor Speed (rpm)	Flow rate		Pressure Max. 60 Hz Motor (HP)						Freq. (spm)	Motor Speed (rpm)	Connections ball valves
		18.5	22	30	37	45	55					25	30	40	50	60	75			
10 bar	Pres. Max.	X	Y	AA	AB	AC	AD	1,440	145 psi	Pres. Max.	X	Y	AA	AB	AC	AD	1,725			
l/h		bar							gph		psi									
Ø 28 mm - Swept Volume: 73.9 cm <sup>3</sup>									Ø 1.10 in. - Swept Volume: 4.51 in <sup>3</sup>											1"
301	213	670	800	980				73	95.4	67.5	9,717	11,603	14,214				88	(Ø 20 mm - LD) (Ø 0.79 in - LD)		
396	281	520	620	850	980			93	125.5	89.1	7,542	8,992	12,328	14,214			112			
498	353	410	490	680	840	980		117	157.9	111.9	5,947	7,107	9,863	12,183	14,214		140			
621	440	330	395	540	670	820	980	146 <sup>1</sup>	Not applicable to a 60 Hz Motor											
Ø 32 mm - Swept Volume: 96.5 cm <sup>3</sup>									Ø 1.26 in. - Swept Volume: 5.89 in <sup>3</sup>											1"
393	306	510	610	750				73	124.6	97	7,397	8,847	10,878				88	(Ø 20 mm - LD) (Ø 0.79 in - LD)		
517	402	400	475	660	750			93	163.9	127.4	5,801	6,889	9,572	10,878			112			
650	506	315	380	520	640	750		117	206.1	160.4	4,569	5,511	7,542	9,282	10,878		140			
812	632	255	300	415	515	630	750	146 <sup>1</sup>	Not applicable to a 60 Hz Motor											
Ø 36 mm - Swept Volume: 122.2 cm <sup>3</sup>									Ø 1.42 in. - Swept Volume: 7.46 in <sup>3</sup>											1"
497	410	400	480	590				73	157.6	130	5,801	6,962	8,557				88	(Ø 25 mm - LD) (Ø 0.98 in - LD)		
654	540	315	375	515	590			93	207.3	171.2	4,569	5,439	7,469	8,557			112			
823	680	250	300	410	510	590		117	260.9	215.6	3,626	4,351	5,947	7,397	8,557		140			
1,027	848	200	240	330	405	490	590	146 <sup>1</sup>	Not applicable to a 60 Hz Motor											
Ø 40 mm - Swept Volume: 150.8 cm <sup>3</sup>									Ø 1.57 in. - Swept Volume: 9.2 in <sup>3</sup>											1"
614	527	320	390	480				73	194.6	167.1	4,641	5,656	6,962				88	(Ø 25 mm - LD) (Ø 0.98 in - LD)		
808	694	255	300	420	480			93	256.1	220.0	3,698	4,351	6,092	6,962			112			
1016	873	200	240	330	410	480		117	322.1	276.7	3,901	3,481	4,786	5,947	6,962		140			
1,268	1,089	160	190	260	330	400	480	146 <sup>1</sup>	Not applicable to a 60 Hz Motor											

<sup>1</sup>Do not use with 60 Hz motor  
Flushing ring is standard for the packing  
LD = Hardener valves - double valve

## Design Specifications

### Model PX with Metallic Double Diaphragm Liquid End Type MX

Flow rate		Pressure Max. 50 Hz Motor (kW)								Freq. (spm)  Motor Speed (rpm)	Flow rate		Pressure Max. 60 Hz Motor (HP)						Freq. (spm)  Motor Speed (rpm)	Connections ball valves
		18.5	22	30	37	45	55	75	25				30	40	50	60	75			
10 bar	Pres. Max.	X	Y	AA	AB	AC	AD	AE	1,440	145 psi	Pres. Max.	X	Y	AA	AB	AC	AD	1,725		
l/h		bar								gph		psi								
<b>Ø 22 mm - Swept Volume: 45.62 cm<sup>3</sup></b>										<b>Ø 0.87 in. - Swept Volume: 2.78 in<sup>3</sup></b>										
185	95	922	1,100	1,372					73	58.6	30.1	13,372	15,954	19,899				88	Suction: 1" 1/2 NPT f  Discharge 3/4" MP (Ø 15.9 mm - LD) (Ø 0.625 in - LD)	
235	122	723	864	1,184	1,372				93	74.5	38.7	10,486	12,531	17,172	19,899			112		
296	153	575	686	941	1,164	1,372			117	93.8	48.5	8,340	9,950	13,648	16,882	19,899		140		
369	191	461	550	754	933	1,137	1,372		146	117.0	60.5	6,686	7,977	10,936	13,532	16,491	19,899	175		
443	229	384	459	629	778	948	1,161	1,372	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 24 mm - Swept Volume: 53.52 cm<sup>3</sup></b>										<b>Ø 0.94 in. - Swept Volume: 3.27 in<sup>3</sup></b>										
213	125	785	938	1,169					73	67.5	39.6	11,385	13,605	16,955				88	Suction: 1" 1/2 NPT f  Discharge: 3/4" MP (Ø 19 mm - LD) (Ø 0.75 in - LD)	
272	159	616	736	1,009	1,169				93	86.2	50.4	8,934	10,675	14,634	16,955			112		
342	200	490	585	802	992	1,169			117	108.4	63.4	7,107	8,485	11,632	14,388	16,955		140		
427	250	392	469	643	795	969	1,169		146	135.4	79.3	5,685	6,802	9,326	11,530	14,054	16,955	175		
512	299	327	391	536	663	808	990	1,169	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 25 mm - Swept Volume: 60.80 cm<sup>3</sup></b>										<b>Ø 0.98 in. - Swept Volume: 3.71 in<sup>3</sup></b>										
242	153	691	825	1,029					73	76.7	48.5	10,022	11,966	14,924				88	Suction: 1" 1/2 NPT f  Discharge: 3/4" MP (Ø 19 mm - LD) (Ø 0.75 in - LD)	
309	195	543	648	888	1,029				93	98.0	61.8	7,876	9,398	12,879	14,924			112		
388	247	431	515	706	873	1,029			117	123.0	78.3	6,251	7,469	10,240	12,662	14,924		140		
485	309	345	412	566	700	853	1,029		146	153.7	98.0	5,004	5,976	8,209	10,153	12,372	14,924	175		
581	370	288	344	472	584	711	871	1,029	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 30 mm - Swept Volume: 85.82 cm<sup>3</sup></b>										<b>Ø 1.18 in. - Swept Volume: 5.24 in<sup>3</sup></b>										
342	256	490	585	729					73	108.4	81.2	7,107	8,485	10,573				88	1" 1/2  (Ø 28.6 mm - LD) (Ø 1.125 in - LD)	
436	323	384	459	629	729				93	138.2	102.4	5,569	6,657	9,123	10,573			112		
549	413	305	365	500	619	729			117	174.0	130.9	4,424	5,294	7,252	8,978	10,573		140		
685	517	245	292	401	496	604	729		146	217.1	168.9	3,553	4,235	5,816	7,194	8,760	10,573	175		
822	620	204	244	334	413	504	617	729	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 31 mm - Swept Volume: 90.21 cm<sup>3</sup></b>										<b>Ø 1.22 in. - Swept Volume: 5.50 in<sup>3</sup></b>										
360	272	466	556	694					73	114.1	86.2	6,759	8,064	10,066				88	(Ø 28.6 mm - LD) (Ø 1.125 in - LD)	
459	347	366	436	599	694				93	145.5	110.0	5,308	6,324	8,688	10,066			112		
576	437	290	347	476	588	694			117	182.6	138.5	4,206	5,033	6,904	8,528	10,066		140		
720	547	233	278	381	471	575	694		146	228.2	173.4	3,379	4,032	5,526	6,831	8,340	10,066	175		
863	656	194	232	318	393	479	587	694	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 33 mm - Swept Volume: 104.83 cm<sup>3</sup></b>										<b>Ø 1.30 in. - Swept Volume: 6.40 in<sup>3</sup></b>										
418	330	401	479	597					73	132.5	104.6	5,816	6,947	8,659				88	(Ø 31.75 mm - LD) (Ø 1.25 in - LD)	
533	422	314	376	515	597				93	169.0	133.8	4,554	5,453	7,469	8,659			112		
670	532	250	298	409	506	597			117	212.4	168.6	3,626	4,322	5,932	7,339	8,659		140		
837	664	200	239	328	406	494	597		146	265.3	210.5	2,901	3,466	4,757	5,889	7,165	8,659	175		
1,003	797	167	199	273	338	412	505	597	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 35 mm - Swept Volume: 114.96 cm<sup>3</sup></b>										<b>Ø 1.38 in. - Swept Volume: 7.02 in<sup>3</sup></b>										
459	371	365	436	544					73	145.5	117.6	5,294	6,324	7,890				88	(Ø 31.75 mm - LD) (Ø 1.25 in - LD)	
584	474	287	342	470	544				93	185.1	150.3	4,163	4,960	6,817	7,890			112		
735	596	228	272	373	462	544			117	233.0	188.9	3,307	3,945	5,410	6,701	7,890		140		
918	745	182	218	299	370	451	544		146	291.0	236.2	2,640	3,162	4,337	5,366	6,541	7,890	175		
1,100	894	152	182	249	308	376	461	544	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 38 mm - Swept Volume: 136.81 cm<sup>3</sup></b>										<b>Ø 1.50 in. - Swept Volume: 8.35 in<sup>3</sup></b>										
546	452	307	367	457					73	173.1	143.3	4,453	5,323	6,628				88	(Ø 38.1 mm - LD) (Ø 1.5 in - LD)	
695	575	241	288	394	457				93	220.3	182.3	3,495	4,177	5,714	6,628			112		
875	725	191	229	313	388	457			117	277.4	229.8	2,770	3,321	4,540	5,627	6,628		140		
1092	906	153	183	251	311	379	457		146	346.2	287.2	2,219	2,654	3,640	4,511	5,497	6,628	175		
1310	1087	128	153	209	259	316	387	457	175 <sup>1</sup>	Not applicable with a 60 Hz motor										
<b>Ø 47 mm - Swept Volume: 206.76 cm<sup>3</sup></b>										<b>Ø 1.85 in. - Swept Volume: 12.62 in<sup>3</sup></b>										
825	727	203	242	302					73	261.5	230.5	2,944	3,510	4,380				88	(Ø 38.1 mm - LD) (Ø 1.5 in - LD)	
1,051	927	159	190	261	302				93	333.2	293.9	2,306	2,756	3,785	4,380			112		
1,323	1,167	126	151	207	256	302			117	419.4	369.9	1,827	2,190	3,002	3,713	4,380		140		
1,651	1,457	101	121	166	205	250	302		146	523.4	461.9	1,465	1,755	2,408	2,973	3,626	4,380	175		
1,980	1,748	84	101	138	171	209	256	302	175 <sup>1</sup>	Not applicable with a 60 Hz motor										

<sup>1</sup>Do not use with 60 Hz motor  
Suction lift: 7 feet water min. pump flooded  
LD = Hardener valves - double valve

## Design Specifications

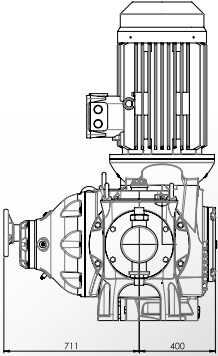
### Model PX with Metallic Liquid End with Double PTFE Diaphragm Type HX

Flow rate		Pressure Max. 50 Hz Motor (kW)						Freq. (spm)	Motor Speed (rpm)	Flow rate		Pressure Max. 60 Hz Motor (HP)						Freq. (spm)	Motor Speed (rpm)	Connections ball valves
		18.5	22	30	37	45	55					25	30	40	50	60	75			
10 bar	Pres. Max.	X	Y	AA	AB	AC	AD	1,440	145 psi	Pres. Max.	X	Y	AA	AB	AC	AD	1,725			
l/h		bar							gph		psi									
Ø 55 mm - Swept Volume: 285.10 cm <sup>3</sup> - Diaphragm: 268 mm									Ø 2.17 in - Swept Volume: 17.4 in <sup>3</sup> - Membrane: 10.55 in									2"		
1,186	956	173	207	252				73	376.0	303.1	2,509	3,002	3,655				88			
1,511	1,218	136	162	222	252			93	479.0	386.1	1,973	2,350	3,220	3,655			112			
1,901	1,532	108	129	177	219	252		117	602.6	485.7	1,566	1,871	2,567	3,176	3,655		140			
2,372	1,912	86	103	142	175	213	252	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 63 mm - Swept Volume: 374.07 cm <sup>3</sup> - Diaphragm: 268 mm									Ø 2.48 in - Swept Volume: 22.83 in <sup>3</sup> - Diaphragm: 10.55 in									2"		
1,556	1,329	132	158	192				73	493.3	421.3	1,914	2,292	2,785				88			
1,982	1,693	103	124	169	192			93	628.3	536.7	1,494	1,798	2,451	2,785			112			
2,494	2,130	82	98	135	167	192		117	790.6	675.2	1,189	1,421	1,958	2,422	2,785		140			
3,113	2,659	66	79	108	133	163	192	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 70 mm - Swept Volume: 461.81 cm <sup>3</sup> - Diaphragm: 268 mm									Ø 2.76 in - Swept Volume: 28.18 in <sup>3</sup> - Membrane: 10.55 in									2"		
1,921	1,698	107	128	155				73	609.0	538.3	1,552	1,856	2,248				88			
2,448	2,164	84	100	137	155			93	776.0	686.0	1,218	1,450	1,987	2,248			112			
3,079	2,721	66	79	109	135	155		117	976.1	862.6	957	1,146	1,581	1,958	2,248		140			
3,843	3,397	53	64	87	108	132	155	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 75 mm - Swept Volume: 530.14 cm <sup>3</sup> - Diaphragm: 268 mm									Ø 2.95 in - Swept Volume: 32.35 in <sup>3</sup> - Diaphragm: 10.55 in									2"		
2,205	1,984	93	111	135				73	699.0	628.9	1,348	1,610	1,958				88			
2,810	2,529	73	87	119	135			93	890.8	801.7	1,059	1,262	1,726	1,958			112			
3,535	3,181	58	69	95	117	135		117	1,120.6	1,008.4	841	1,001	1,378	1,696	1,958		140			
4,411	3,969	46	55	76	94	115	135	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 80 mm - Swept Volume: 603.19 cm <sup>3</sup> - Diaphragm: 308 mm									Ø 3.15 in - Swept Volume: 36.81 in <sup>3</sup> - Diaphragm: 12.1 in									3"		
2,509	2,290	82	98	119				73	795.4	725.9	1,189	1,421	1,726				88			
3,197	2,918	64	76	105	119			93	1,013.5	925.0	928	1,102	1,523	1,726			112			
4,022	3,671	51	61	83	103	119		117	1,275.0	1,163.7	740	885	1,204	1,494	1,726		140			
5,019	4,581	41	49	67	82	101	119	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 90 mm - Swept Volume: 763.41 cm <sup>3</sup> - Diaphragm: 308 mm									Ø 3.54 in - Swept Volume: 46.6 in <sup>3</sup> - Diaphragm: 12.1 in									3"		
3,176	2,962	64	77	94				73	1,006.8	939.0	928	1,117	1,363				88			
4,046	3,774	50	60	83	94			93	1,282.6	1,196.4	725	870	1,204	1,363			112			
5,091	4,748	40	48	66	81	94		117	1,613.9	1,505.1	580	696	957	1,175	1,363		140			
6,353	5,926	32	38	53	65	79	94	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 100 mm - Swept Volume: 942.48 cm <sup>3</sup> - Diaphragm: 308 mm									Ø 3.94 in - Swept Volume: 57.5 in <sup>3</sup> - Diaphragm: 12.1 in									3"		
3,921	3,713	52	62	76				73	1,243.0	1,177.0	754	899	1,102				88			
4,996	4,732	41	49	67	76			93	1,583.8	1,500.1	595	711	972	1,102			112			
6,285	5,953	32	39	53	66	76		117	1,992.4	1,887.1	464	566	769	957	1,102		140			
7,843	7,428	26	31	42	53	64	76	146 <sup>1</sup>	Not applicable with a 60 Hz motor											
Ø 105 mm - Swept Volume: 1,039.08 cm <sup>3</sup> - Diaphragm: 308 mm									Ø 4.13 in - Swept Volume: 63.41 in <sup>3</sup> - Diaphragm: 12.1 in									3"		
4,323	4,118	47	56	69				73	1,370.4	1,305.4	682	812	1,001				88			
5,508	5,248	37	44	61	69			93	1,746.1	1,663.6	537	638	885	1,001			112			
6,929	6,601	29	35	48	60	69		117	2,196.5	2,092.6	421	508	696	870	1,001		140			
8,647	8,238	23	28	38	48	58	69	146 <sup>1</sup>	Not applicable with a 60 Hz motor											

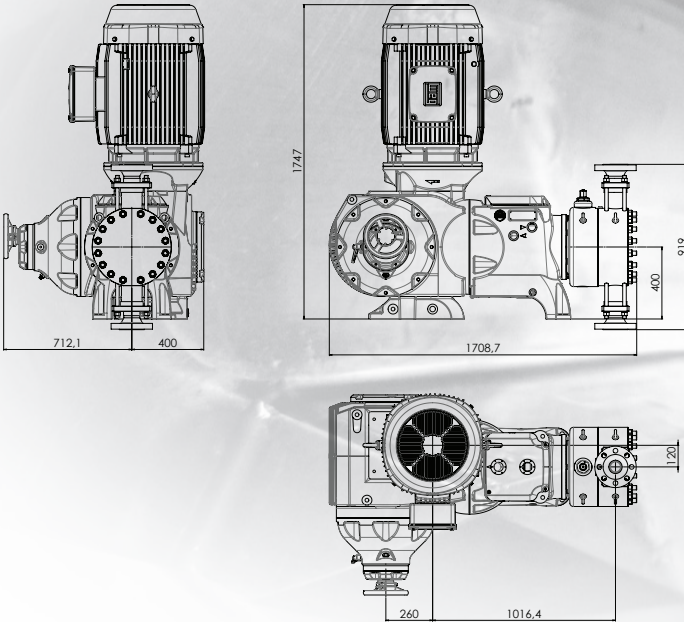
<sup>1</sup>Do not use with 60 Hz motor  
NS = Single valve

## Dimensions

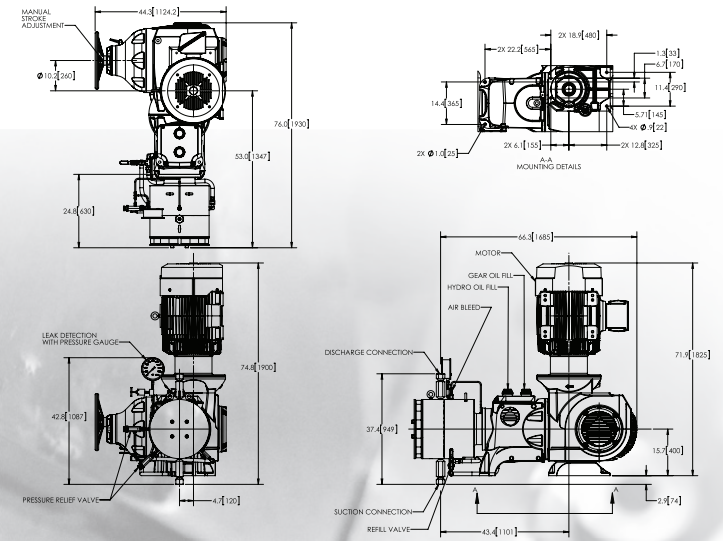
### Packed plunger liquid end type NX



### Double PTFE diaphragm liquid end type HX



### Double metallic diaphragm liquid end type MX



## Weight and Packing

Version	Net weight (*)		Gross weight (*)		Packing (**)	
	kg	lbs	kg	lbs	( L x W x H ) mm	( L x W x H ) in
Simplex - NX Liquid end	1,270	2,800	1,600	3,527	1,950 x 1,320 x 2,100 (***)	76.8 x 52 x 82.7 (***)
Simplex - MX Liquid end	1,690	3,726	2,080	4,586	2,180 x 1,320 x 2,250 (***)	85.8 x 52 x 88.6 (***)
Simplex - HX Liquid end	1,570	3,461	1,870	4,123	1,950 x 1,320 x 2,050 (***)	76.8 x 52 x 82.7 (***)
Duplex - NX Liquid end	3,565	7,859	4,130	9,105	2,850 x 2,150 x 1,900	112.2 x 84.6 x 74.8
Duplex - MX Liquid end	4,405	9,711	5,000	11,023	2,850 x 2,150 x 1,900	112.2 x 84.6 x 74.8
Duplex - HX Liquid end	4,165	9,182	4,700	10,362	2,850 x 1,900 x 1,900	112.2 x 84.6 x 74.8
Triplex - NX Liquid end	4,960	10,935	5,670	12,500	3,750 x 2,200 x 1,900	147.6 x 86.6 x 74.8
Triplex - MX Liquid end	6,220	13,713	7,000	15,432	3,750 x 2,200 x 1,900	147.6 x 86.6 x 74.8
Triplex - HX Liquid end	5,860	12,919	6,560	14,642	3,750 x 2,200 x 1,900	147.6 x 86.6 x 74.8

\* Weight without motor. Duplex and triplex versions: frame weight is included (DX about 2, 205 lbs /TX about 2425 lbs)

\*\* According to the order; one addition case could be necessary for the oil cans

\*\*\* Packing is given for vertical motor