Spence™ Condensate Commander Pump

Figure 1. *Condensate Commander Pump*

Introduction

Condensate Commander is a pressure vessel drainer pump operated by steam, compressed air or other pressurized gas to 200 psig / 13.8 bar. Body is a fabricated steel ASME code to 200 psi / 13.8 bar. Pump mechanism is all stainless steel without external packing or seals. Mechanism employs one spring operating in continuous compression. When required, unit is equipped with an external cycle counter, sight glass and insulating jacket.

Features

- **No Electricity Needed -** Uses pressurized gas or steam as the pumping force. Preferable for remote or hazardous locations.
- **Superior Spring -** Single spring mechanism operates in compression only to assure long service life Stainless steel snap action mechanism in continuous compression offers superior performance.
- **Rugged Mechanism -** Unaffected by turbulence. No adjustments or maintenance necessary.
- **Superior Valve Technology -** Supply and exhaust valves are lapped for tight shut off. Self-centering design assures reliable performance. Unique floating ball design and hardened sealing surface of the supply valve provide long service life.
- **Suitable for a Wide Variety of Liquids -** Condensate from steam systems. High back pressure, low pressure and vacuum systems. Ideal in a sump or other submersible applications. Suitable for acids and other process fluids that may be incompatible with conventional pumps.

Specifications

The specifications section on this page provides the ratings and other specifications for the Condensate Commander.

Available Configurations

Classic Vertical: Standard capacity, vertical tank
Big Boy: Super capacity, horizontal tank
Classic Horizontal: Standard capacity, high pressure, horizontal tank
Little Boy: Reduced capacity, vertical tank
Skid Mounted System: Standard or custom multiplex configurations

Maximum Operating Pressure(1)

See Table 1

Operating Characteristics(1)

See Table 2

Venter Receiver Sizing

See Table 3

Percent of Flash Steam Formed

See Table 4

Inlet Receiver Sizing

See Table 5

Maximum Capacity

See Tables 6 and 7

Materials of Construction

Tank Weldment: Steel
Trip Mechanism with Flange: Ductile Iron, Stainless steel and Steel
Pipe Plug and Inlet and Outlet Nipple: Steel
Water Level Gauge: Bronze
Inlet and Outlet Check Valve: Stainless steel and Bronze
Gasket: Graphite
Inlet and Outlet Reducer: M. Iron

Options

Stainless Steel Tank
High Temperature
High Pressure

Accessory options

Glass Water Gauge
Cycle Counter
Check Valves
Insulating Jacket

Approximate Weights

See Tables 8, 9 and 10

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

***Table 1**. Maximum Operating Conditions*

PUMP TYPE	MAXIMUM OPERATING PRESSURE		MAXIMUM OPERATING TEMPERATURE	
	psig	bar	°F	°C
Little Boy	150	10.3	400	204
Big Boy	150	10.3		
Classic Vertical	200	13.8		
Classic Horizontal	250	17.2		

***Table 2**. Operating Characteristics*

PUMP TYPE	PUMP DISCHARGE PER CYCLE	MAXIMUM INSTANTANEOUS DISCHARGE RATE	STEAM CONSUMPTION	AIR CONSUMPTION	RECOMMENDED FILLING HEAD
Little Boy	4.2 to 5.1 gal. / 0.016 to 0.019 m^3	60 GPM / 227 LPM	3 lbs. per 1000 lbs. of liquid pumped / 1 kg per 454 kg of liquid pumped	100 SCF per 1000 lbs. of liquid pumped / 2.68 Nm^3 per 454 kg of liquid pumped	6 in. / 152 mm
Classic Vertical	7.8 to 8.6 gal. / 0.030 to 0.032 m^3	90 GPM / 341 LPM			12 in. / 305 mm
Classic Horizontal	8.8 to 11 gal. / 0.033 to 0.291 m^3	90 GPM / 341 LPM			12 in. / 305 mm
Big Boy	140 to 185 gal. / 0.530 to 0.700 m^3	195 GPM / 738 LPM			24 in. / 610 mm

Table 3. *Vented Receiver Sizing Table*

FLASH VAPOR		PIPE DIAMETER		VENT LINE SIZE	
lbs/hr	kg/hr	In.	mm	In.	mm
75	34	4	102	1 1/2	38
150	68	6	152	2	51
300	136	8	203	3	76
600	272	10	254	4	102
900	408	12	305	6	152
1200	544	16	406	6	152
2000	907	20	508	8	203

Table 4. *Percent of Flash Steam Formed*

INITIAL STEAM PRESURE		SATURATED TEMPERATURE		RECEIVER TANK PRESSURE															
				0		5		10		20		30		40		50		75	
psig	bar	°F	°C	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar
10	0.69	239	115	3.0	0.21	2.0	0.14	0	0	0	0	0	0	0	0	0	0	0	0
25	1.72	267	131	5.7	0.39	4.1	0.28	3.0	0.21	1.0	0.07	0	0	0	0	0	0	0	0
50	3.45	298	148	9.0	0.62	7.4	0.51	6.2	0.43	4.3	0.30	2.6	0.18	1.0	0.07	0	0	0	0
75	5.17	320	160	11.3	0.78	10.8	0.74	8.6	0.59	6.7	0.46	5.0	0.34	3.7	0.26	2.5	0.17	0	0
100	6.90	338	170	13.3	0.92	11.7	0.81	10.6	0.73	8.7	0.60	7.0	0.48	5.7	0.39	4.6	0.32	2.2	0.15
125	8.62	353	178	14.8	1.02	13.4	0.92	12.2	0.84	10.3	0.71	8.7	0.60	7.4	0.51	3.6	0.25	3.8	0.26

Table 5. *Inlet Receiver Sizing Table*

LIQUID		RECEIVER PIPE SIZE									
		3		4		6		8		10	
lbs/hr	kg/hr	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
> 500	> 227	2	51	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
1000	454	2	51	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
1500	680	3	76	2	51	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
2000	907	3.5	89	2	51	1	25	- - - -	- - - -	- - - -	- - - -
3000	1361	- - - -	- - - -	3	76	2	51	- - - -	- - - -	- - - -	- - - -
4000	1814	- - - -	- - - -	4	102	2	51	1	25	- - - -	- - - -
5000	2268	- - - -	- - - -	6	152	3	76	2	51	- - - -	- - - -
6000	2722	- - - -	- - - -	- - - -	- - - -	3	76	2	51	- - - -	- - - -
7000	3175	- - - -	- - - -	- - - -	- - - -	3	76	2	51	- - - -	- - - -
8000	3629	- - - -	- - - -	- - - -	- - - -	4	102	2	51	- - - -	- - - -
9000	4082	- - - -	- - - -	- - - -	- - - -	4.5	114	3	76	2	51
10,000	4536	- - - -	- - - -	- - - -	- - - -	5	127	3	76	2	51
11,000	4990	- - - -	- - - -	- - - -	- - - -	5	127	3	76	2	51

- **Retrofit Mechanism Available** - Head assembly can fit other manufacturer's tanks.
- **Required suction head is minimal -** Optimal performance achieved at only 12 in. / 305 mm.

Principle of Operation

The vent valve is open, the pressure supply valve is closed and the float is positioned in the lower part of the tank as the condensate or other liquid enters the tank through the inlet check valve. As the tank fills with liquid, the float rises to the point where the spring mechanism snaps past the center position. The compressed spring instantly closes the vent valve and opens the pressure supply. This allows pressure into the tank which forces the liquid through the outlet check valve.

As the liquid level falls, the float lowers to the point where the spring mechanism snaps past the center position which immediately closes the pressure supply valve and opens the vent valve. The pressure in the tank decreases, allowing liquid to flow through the inlet check valve, repeating the cycle

Installation

Vented Receiver

Install the inlet receiver horizontally with at least 12 in. / 305 mm above the pump to efficiently drain condensate from an open system.

Condensate is being pumped from a vented receiver to an overhead elevated condensate return line that may contain pressure. For safety, the pump exhaust and receiver should be vented to atmosphere if steam is used for the motive pressure.

Inlet Receiver

Install the vented receiver horizontally with at least 12 in. / 305 mm above the pump to allow sufficient condensate collection in closed system.

Condensate is flowing from a pressurized system to another pressurized system with greater pressure. Both the inlet and return line may be elevated. This installation will also service a high capacity process installation using a pressurized receiver.

Note

To allow for sufficient volume of condensate and flash vapor, the receiver must be sized adequately to permit the complete separation of flash vapor from condensate.

The receiver must be sized to provide the minimum condensate capacity required to prevent equipment flooding.

The receiver may be either an ASME coded tank or a length of large diameter pipe. A safety relief valve may be required.

Submerged Pump

Condensate Commander Pumps can pump liquids from low lying areas such as manholes, steam pits or any area that may collect liquid or flood. The non-electric feature makes it a good choice if steam or any other gas is readily available for use as the driving force.

Liquid is pumped from a sump, manhole or other lowlying area where it may accumulate. For back pressure applications, multiply the total vertical lift by 0.5 plus any back pressure in the return line.

Skid Mounted System

Where the condensate load exceeds the capacity of one Condensate Commander Pump, multiple pumps may be used in tandem. Skid mounted units may be simplex (1 pump), duplex (2 pumps), triplex (3 pumps) or quadruplex (4 pumps). The units are equipped with a receiver, Condensate Commander Pump(s) and all necessary piping fully connected and ready for use.

The skid mount systems are designed to provide a complete condensate collection and condensate pump unit ready to pipe. All necessary connections are in place. The filling head dimension has already been determined.

Capacity

Capacities shown in Tables 6 and 7 are obtained with factory supplied check valves. For other multiplex capacities, consult factory.

Table 6. *Condensate Commander Pump Capacity in lbs/hr (Imperial)*

MOTIVE PRESSURE, psig	BACK PRESSURE, psig	FILL HEAD 6 IN. LITTLE BOY		FILL HEAD 12 IN. CLASSIC AND HORIZONTAL				FILL HEAD 24 IN. BIG BOY	FILL HEAD 12 IN. CLASSIC DUPLEX
		NPS 1 x 1	NPS 1.5 x 1.5	NPS 1 x 1	NPS 1.5 x 1.5	NPS 2 x 2	NPS 3 x 2	NPS 4 x 4	NPS 3 x 2
250	40	- - - -	- - - -	2703	6392	10196	11537	- - - -	23073
	60	- - - -	- - - -	3670	7203	7787	8551	- - - -	17101
	80	- - - -	- - - -	3457	6071	6531	7105	- - - -	14209
	100	- - - -	- - - -	3891	5278	5753	6202	- - - -	12404
	120	- - - -	- - - -	3700	4730	5213	5587	- - - -	11173
	150	- - - -	- - - -	3196	4074	4552	4842	- - - -	9683
	175	- - - -	- - - -	2845	3624	4092	4331	- - - -	8663
	200	- - - -	- - - -	2456	3152	3650	3847	- - - -	7694
	225	- - - -	- - - -	1963	2732	3221	3380	- - - -	6761
200	40	- - - -	- - - -	2503	5919	9441	10682	- - - -	21364
	60	- - - -	- - - -	3398	6669	7210	7918	- - - -	15835
	80	- - - -	- - - -	4021	5579	6110	6619	- - - -	13238
	100	- - - -	- - - -	3741	4855	5403	5804	- - - -	11607
	120	- - - -	- - - -	3286	4242	4768	5088	- - - -	10177
	150	- - - -	- - - -	2741	3533	4058	4297	- - - -	8593
	175	- - - -	- - - -	2151	2926	3476	3661	- - - -	7321
150	25	1814	5739	2314	5722	10376	12105	47994	24210
	40	3058	4860	3386	7077	8465	9450	45382	18899
	60	3127	4234	4464	6338	6995	7630	39757	15260
	80	2620	3472	3763	4974	5607	6040	35452	12080
	100	2261	2957	3168	4150	4743	5064	27971	10128
	120	1935	2530	2669	3522	4156	4408	20613	8815
125	25	2470	5645	2942	6740	10712	12337	48101	24674
	40	3215	4619	3983	7197	7965	8836	44256	17672
	60	2788	3768	4066	5513	6220	6758	38625	13516
	80	2358	3117	3326	4416	5064	5432	33012	10863
	100	1920	2535	2656	3544	4216	4482	25862	8964
	115	1491	2151	1952	2976	3589	3788	17512	7575
100	15	2036	6211	2762	6393	11889	14241	47156	28482
	25	3132	5336	3763	7658	9818	11170	45212	22340
	40	3082	4323	4569	6603	7403	8164	42041	16327
	60	2534	3406	3612	4893	5641	6092	35589	12184
	80	1959	2620	2716	3681	4428	4721	27783	9442
75	15	2975	6022	3867	7978	11977	14038	46485	28075
	25	3340	4940	4649	7823	8914	10026	43084	20052
	40	2817	3891	4078	5723	6654	7273	40027	14546
	60	2003	2732	2786	3863	4721	5057	20002	10114
50	10	3701	6273	4692	9227	12492	14737	46092	29474
	25	2976	4250	4343	6387	7603	8421	39727	16843
	40	2053	2891	2863	4120	5172	5578	19899	11156
25	5	3872	6625	5825	10486	13760	16560	45329	33120
	10	3315	5063	4845	7774	9812	11193	39945	22385
	15	2751	4016	3950	6043	7657	8513	18694	17026
10	2	3894	6646	5610	10348	14520	17621	- - - -	35242
	5	2945	4600	4150	6954	9708	11085	- - - -	22170
5	2	2981	5115	4130	7602	11747	13781	- - - -	27562

Table 7. *Condensate Commander Pump Capacity in kg/hr (Metric)*

MOTIVE PRESSURE, bar	BACK PRESSURE, bar	FILL HEAD 152 mm LITTLE BOY		FILL HEAD 305 mm CLASSIC AND HORIZONTAL				FILL HEAD 610 mm BIG BOY	FILL HEAD 305 mm CLASSIC DUPLEX
		DN 25 x 25	DN 38 x 38	DN 25 x 25	DN 38 x 38	DN 51 x 51	DN 76 x 51	DN 102 x 102	DN 76 x 51
17.24	2.76	- - - -	- - - -	1226	2899	4625	5233	- - - -	10466
	4.14	- - - -	- - - -	1665	3267	3532	3879	- - - -	7757
	5.52	- - - -	- - - -	1568	2754	2962	3223	- - - -	6445
	6.90	- - - -	- - - -	1765	2394	2610	2813	- - - -	5626
	8.28	- - - -	- - - -	1678	2146	2365	2534	- - - -	5068
	10.34	- - - -	- - - -	1450	1848	2065	2196	- - - -	4392
	12.07	- - - -	- - - -	1290	1644	1856	1965	- - - -	3930
	13.79	- - - -	- - - -	1114	1430	1656	1745	- - - -	3490
	15.52	- - - -	- - - -	890	1239	1461	1533	- - - -	3067
13.79	2.76	- - - -	- - - -	1135	2685	4282	4845	- - - -	9691
	4.14	- - - -	- - - -	1541	3025	3270	3592	- - - -	7183
	5.52	- - - -	- - - -	1824	2531	2771	3002	- - - -	6005
	6.90	- - - -	- - - -	1697	2202	2451	2633	- - - -	5265
	8.28	- - - -	- - - -	1491	1924	2163	2308	- - - -	4616
	10.34	- - - -	- - - -	1243	1603	1841	1949	- - - -	3898
	12.07	- - - -	- - - -	976	1327	1577	1661	- - - -	3321
10.34	1.72	823	2603	1050	2595	4707	5491	21770	10982
	2.76	1387	2204	1536	3210	3840	4287	20585	8573
	4.14	1418	1921	2025	2875	3173	3461	18034	6922
	5.52	1188	1575	1707	2256	2543	2740	16081	5479
	6.90	1026	1341	1437	1882	2151	2297	12688	4594
	8.28	878	1148	1211	1598	1885	1999	9350	3998
8.62	1.72	1120	2561	1334	3057	4859	5596	21819	11192
	2.76	1458	2095	1807	3265	3613	4008	20075	8016
	4.14	1265	1709	1844	2501	2821	3065	17520	6131
	5.52	1070	1414	1509	2003	2297	2464	14974	4927
	6.90	871	1150	1205	1608	1912	2033	11731	4066
	7.93	676	976	885	1350	1628	1718	7943	3436
6.90	1.03	924	2817	1253	2900	5393	6460	21390	12919
	1.72	1421	2420	1707	3474	4453	5067	20508	10133
	2.76	1398	1961	2072	2995	3358	3703	19070	7406
	4.14	1149	1545	1638	2219	2559	2763	16143	5527
	5.52	889	1188	1232	1670	2009	2141	12602	4283
5.17	1.03	1349	2732	1754	3619	5433	6368	21086	12735
	1.72	1515	2241	2109	3549	4043	4548	19543	9096
	2.76	1278	1765	1850	2596	3018	3299	18156	6598
	4.14	909	1239	1264	1752	2141	2294	9073	4588
3.45	0.69	1679	2845	2128	4185	5666	6685	20907	13369
	1.72	1350	1928	1970	2897	3449	3820	18020	7640
	2.76	931	1311	1299	1869	2346	2530	9026	5060
1.72	0.34	1756	3005	2642	4756	6242	7512	20561	15023
	0.69	1504	2297	2198	3526	4451	5077	18119	10154
	1.03	1248	1822	1792	2741	3473	3861	8480	7723
0.69	0.14	1766	3015	2545	4694	6586	7993	- - - -	15986
	0.34	1336	2087	1882	3154	4404	5028	- - - -	10056
0.34	0.14	1352	2320	1873	3448	5328	6251	- - - -	12502

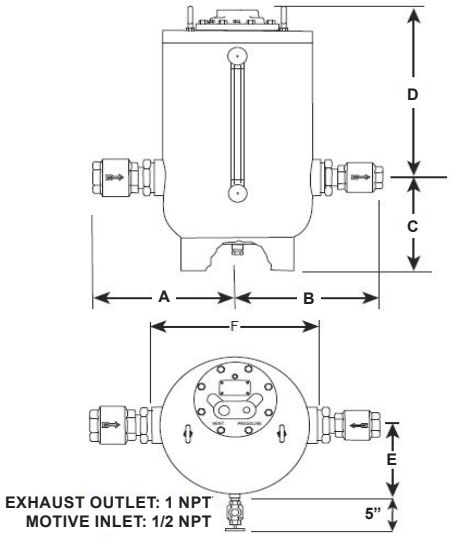

Figure 2. *Classic Pump Dimension*

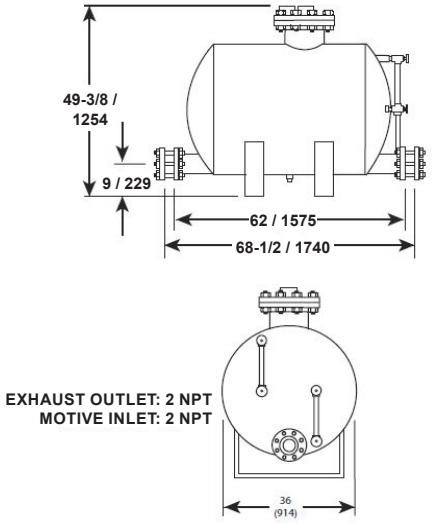

Figure 3. *Big Boy Pump Dimension*

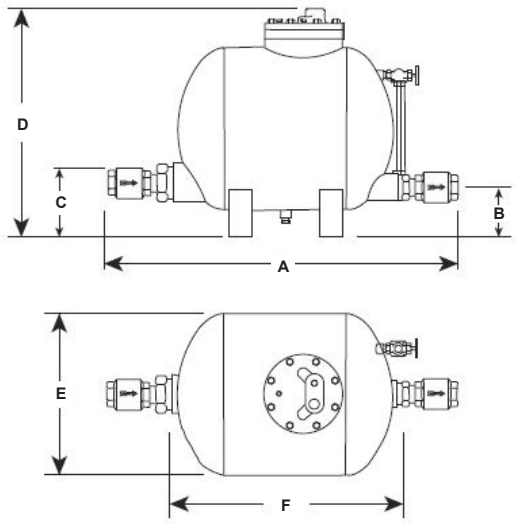

Figure 4. *Horizontal Pump Dimension*

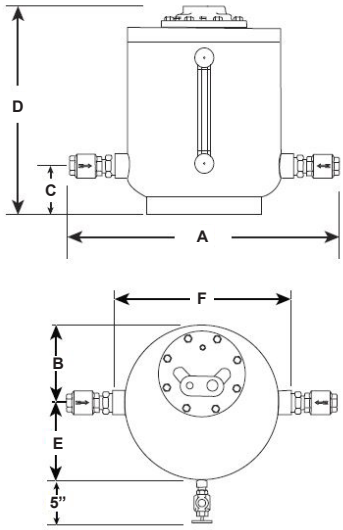

Figure 5. *Little Boy Pump Dimension*

IN. / mm

Table 8. *Classic Pump Dimensions*

SIZE		A		B		C		D		E		F		WEIGHT	
NPS	DN	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	lbs	kg
1 x 1	25 x 25	13-3/8	340	13-3/8	340	11	279	21-3/4	552	9	278	17-3/4	451	168	76
1-1/2 x 1-1/2	38 x 38	14-3/4	375	14-3/4	375	11	279	21-3/4	552	9	278	17-3/4	451	170	77
2 x 2	51 x 51	15	381	15	381	11	279	21	552	9	278	17-3/4	451	173	79
3 x 2	76 x 51	16-1/2	419	15	381	11	279	21-3/4	552	9	278	17-3/4	451	185	84

Table 9. *Horizontal Pump Dimensions*

SIZE		A		B		C		D		E		F		WEIGHT	
NPS	DN	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	lbs	kg
1 x 1	25 x 25	34-1/4	879	5-1/2	140	6	152	25-1/4	641	18	457	25	635	174	79
1-1/2 x 1-1/2	38 x 38	36-3/4	933	5-1/2	140	6	152	25-1/4	641	18	457	25	635	178	81
2 x 2	51 x 51	37-1/8	943	5-1/2	140	6	152	25-1/4	641	18	457	25	635	183	83
3 x 2	76 x 51	38-1/4	971	5-1/2	140	6	152	25-1/4	641	18	457	25	635	190	86

Table 10. *Little Boy Pump Dimensions*

SIZE		A		B		C		D		E		F		WEIGHT	
NPS	DN	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	lbs	kg
1 x 1	25 x 25	26	660	8	203	5	127	21	533	9	229	17	431	17	8
1-1/2 x 1-1/2	38 x 38	29	737	8	203	5	127	21	533	9	229	17	431	155	71

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section. Review the description to the right of each specification and the information in each referenced table or figure. Specify your choice whenever a selection is offered.

Ordering Guide

Available Configuration (Select One)
- ☐ Classic Vertical
- ☐ Big Boy
- ☐ Classic Horizontal
- ☐ Little Boy
- ☐ Skid Mounted System

Body Sizes (Select One)
- ☐ NPS 1 x 1 / DN 25 x 25
- ☐ NPS 1-1/2 x 1-1/2 / DN 38 x 38
- ☐ NPS 2 x 2 / DN 51 x 51 (Not available on Little Boy)
- ☐ NPS 3 x 2 / DN 76 x 51 (Not available on Little Boy)
- ☐ NPS 4 x 4 / DN 102 x 102 (Available on Big Boy only)

Options
- ☐ Stainless Steel Tank
- ☐ High Temperature
- ☐ High Pressure

Accessory Options
- ☐ Glass Water Gauge
- ☐ Cycle Counter
- ☐ Check Valves
- ☐ Insulating Jacket

SpenceValve.com

Emerson

Americas
McKinney, Texas 75069 USA
T +1 800 558 5853
+1 972 548 3574

Asia Pacific
Singapore 128461, Singapore
T +65 6777 8211

Europe
Bologna 40013, Italy
T +39 051 419 0611

Middle East and Africa
Dubai, United Arab Emirates
T +971 4 811 8100

VCBUL-15898-EN © 2021, 2026 Emerson Electric Co. All rights reserved. 03/26
Spence is a mark owned by a subsidiary of Emerson Electric Co. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are property of their respective owners.

Neither Emerson nor any of its affiliated entities assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

SPENCE™