

## Control Panels

HP	Size I.D. Code No.					
	<i>(Ratings: Italic: HP Rated) (Bold: NEMA)</i>					
	1 Ph Motors			3 Ph Motors		
	115v	220v	208v	240v	380v	480v
¼	<b>Q1</b>	<b>QB</b>	<b>QG</b>	<b>Q2</b>	Q3	<b>Q4</b>
⅓	<b>T1</b>	<b>TB</b>	<b>TG</b>	<b>T2</b>	T3	<b>T4</b>
½	<b>AL</b>	<b>AB</b>	<b>AG</b>	<b>A2</b>	A3	<b>A4</b>
¾	<b>B1</b>	<b>BB</b>	<b>BG</b>	<b>B2</b>	<i>QB</i>	<b>B4</b>
1	<b>C1</b>	<b>CB</b>	<b>CG</b>	<b>C2</b>	C3	<b>C4</b>
1½	<i>D1</i>	<i>DB</i>	<b>DG</b>	<b>D2</b>	<i>D3</i>	<b>D4</b>
2	<b>E1</b>	<b>EB</b>	<b>EG</b>	<b>E2</b>	<i>E3</i>	<i>E4</i>
3	<i>F1</i>	<b>FB</b>	<b>FG</b>	<i>F2</i>	<i>F3</i>	<i>F4</i>
5	<i>G1</i>	<i>GB</i>	<i>GG</i>	<i>G2</i>	<i>G3</i>	<i>G4</i>
7½		<i>HB</i>	<i>HG</i>	<i>H2</i>	<i>H3</i>	<i>H4</i>
10			<i>JG</i>	<i>J2</i>	<i>J3</i>	<i>J4</i>
15			<i>KG</i>	<b>K2</b>	<i>K3</i>	<i>K4</i>
20			<b>LG</b>	<i>L2</i>	<i>L3</i>	<i>L4</i>
25			<b>MG</b>	<b>M2</b>	<i>M3</i>	<b>M4</b>
30			<i>NG</i>	<b>N2</b>	<i>N3</i>	<i>N4</i>
40			<b>PG</b>	<i>P2</i>	<i>P3</i>	<i>P4</i>
50			<i>RG</i>	<b>R2</b>	<i>R3</i>	<b>R4</b>
60			<b>SG</b>	<i>S2</i>	<i>S3</i>	<i>S4</i>

Horsepower rating based on standard motors - some submersible motors may have a higher standard amp. draw. Check with factory.

Seq. No.	Sequence of Operation
1	For pumps controlled by any remote pump On-Off device (contact)
4	For pump operation using On & Off submersible float switches
5	Same as above (Seq. 04) except for intrinsically-safe float operation
8	For Jockey Pumps; individual fixed-differential pressure switch & timer
14	For Sump-Sewage pumps with electrodes

**NOTES:**

1. Not Available with UL Listing
2. Flange-mtd. Disc. Handle (instead of Thru-door) is standard

**STD Equipment**

- (1) NEMA 1 Enclosure
- (1) Magnetic Starter
- (2) Ambient-compen. Adj. OL relay
- (1) HOA sw-NEMA 1
- (1) Control Transformer
- (1) Numbered terminal strip
- (1) Custom wiring & field connection dwg.

**PLUS...**

Main disconnect or Circuit Breaker as indicated by TYPE

Type F (Fusible Disconnect)	Type C (Main Circuit Breaker)	Type U (Non-fusible Disconnect)
<p><b>DESCRIPTION:</b></p> <p>The Model E1 Simplex Pump Controller is a fully integrated control package for automatic pump motor sequencing, short-circuit &amp; overload protection, and (optional) alarm annunciation required for a wide variety of pump applications. This model is specifically designed for applications using Condensate, Boiler Feed, Makeup, Sump/Sewage, Submersible, or Jockey pumps. Control panel construction is in accordance with applicable NEC codes and is built to the highest standards of quality control &amp; workmanship. Three Types (Power Configurations) are available and all include the standard equipment outlined below.</p>		

Explanation of Model Numbering					
E1	F	4	D2	-	A14TA27
Simplex	Panel TYPE (See above table)	Sequence of Operation (See table at left on this page)	Size ID Code (HP & Voltage) (See above table)	Options (enter sequentially)(See Page 2)	
Panel in above example includes: Main Fusible Disconnect, 1.5HP/240v 3Ph, for use with submersible floats; includes Optional high level light (Oil tight) with alarm horn & silence PB.					



**WARNING:**

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**Control Panels**

Option Number	General Panel-mounted Optional Equipment	Encl. is NEMA:	Option Number	Options commonly found in Submersible Pump Panels	Encl. is NEMA:
		<sup>1</sup> 1 or 12,3R,4			<sup>1</sup> 1 or 12,3R,4
<b><u>A1</u></b>	Pump RUN lights		<b><u>D9</u></b>	Seal Leak light with Test PB's (Reliance motor)	SAME
A6	Overload trip lights		<b><u>D10</u></b>	Terminals to connect motor over temp switch	
<b><u>A8</u></b>	Power ON light		<b><u>D12</u></b>	Over temp. alarm light (auto reset)	
<b><u>A14</u></b>	High Level alarm light		D14	Over temp. light (Reset: motor/ auto light/manual)	
A19	Low Level alarm light; incl. aux. relay		E33	Aux. (Pump OL trip) contacts for use with remote Model A13-05 type alarm panel	
A22	Misc. alarm light (specify); incl. aux. relay		<b>Option Number</b>	<b>Options commonly found in Submersible Pump Panels</b>	<b>Alarm light: NEMA:</b>
<b><u>A27</u></b>	Alarm Horn with Silence PB		H1	Phase monitor/motor shutdown relay	<sup>1</sup> 1 or Oil tight
A29	Alarm Horn with Silence-Test sw.		H2	Lightning arrestor	
<b><u>C1T</u></b>	Oil tight HOA selectors (NEMA 1 HOA's are incl. in basic panel @ no extra charge)		H3	Surge Capacitor	
<b><u>C2</u></b>	Test-Off-Auto selector		J1	Disch. Fail alarm; incl. timer, light, reset PB	
C4	Misc. or Test PB (specify)		J2	OFF float (submersible) anti-chatter timer	SAME
B1	Hour meter 0-99999.0 non-resettable	SPEC	J4	Terminals to connect Redundant OFF float	SAME
<b><u>E1</u></b>	High Level aux. relay (5A@115VAC dry ckt)	SAME	J23	24V Float switch circuitry (Sequence 3 or 4)	SAME
<b><u>E2</u></b>	Power Loss aux. relay (5A@115VAC dry ckt)	SAME	<b>Number</b>	<b>Separately Mounted Controller Accessories (not included in Controller Part No. - Order sep.)</b>	
E4	Misc. aux. relay (10A@115VAC dry ckt)	SAME	FS-3K	Set of 3 suspension-type submersible floats with bracket	
F5	NEMA 12 Enclosure (See Note 1)		FP-3K	Set of 3 pipe-mtd. submersible floats with pipe support bracket	
F6	NEMA 3R Enclosure (See Note 1)		R11-31	Remote electrode sensing panel (1-compartment tank type)	
F7	NEMA 4 Enclosure (See Note 1)		ES-5K	Set of six (6) suspension-type electrode probe, holder & wire	
F8	NEMA 4X Enclosure (See Note 1)	SPEC	A11-01	Single point High Level alarm remote panel with horn & light	
F9	Add "dead-front" inner door (See Note 1)	SAME	A13-05	Fail safe (3-point) remote alarm annunciator panel; must be ordered with Controller; Controller must also include Options E1 & E2	
<b><u>L1</u></b>	Add UL Panel Label (UL 508-Listing & Follow-up service)	5			

1 For cover devices rated for NEMA 1 service. If cover mtd. devices are on an enclosure which is NEMA 12, 3R, 4, or 4X, (or full size devices are **desired for appearance**) add suffix "T" to Option No.

2 Items which are market "SAME" are identical regardless of enclosure NEMA Type (i.e. suffix "T" need not to be added). For items which are marked "SPEC" consult factory.

3 This Note is not applicable to Simplex E! Panels.

4 Commonly encountered options are **BOLD UNDERLINED** for easy reference.

5 UL Listing of panel having a particular combination of options may not be available. Always Consult Factory for Availability.

## Control Panels

HP	Size I.D. Code No.					
	<i>(Ratings: Italic: HP Rated) (Bold: NEMA)</i>					
	1 Ph Motors			3 Ph Motors		
	115v	220v	208v	240v	380v	480v
¼	<b>Q1</b>	<b>QB</b>	<b>QG</b>	<b>Q2</b>	Q3	<b>Q4</b>
⅓	<b>T1</b>	<b>TB</b>	<b>TG</b>	<b>T2</b>	T3	<b>T4</b>
½	<b>AL</b>	<b>AB</b>	<b>AG</b>	<b>A2</b>	A3	<b>A4</b>
¾	<b>B1</b>	<b>BB</b>	<b>BG</b>	<b>B2</b>	QB	<b>B4</b>
1	<b>C1</b>	<b>CB</b>	<b>CG</b>	<b>C2</b>	C3	<b>C4</b>
1½	<i>D1</i>	<i>DB</i>	<b>DG</b>	<b>D2</b>	<i>D3</i>	<b>D4</b>
2	<b>E1</b>	<b>EB</b>	<b>EG</b>	<b>E2</b>	<i>E3</i>	<i>E4</i>
3	<i>F1</i>	<b>FB</b>	<b>FG</b>	<i>F2</i>	<i>F3</i>	<i>F4</i>
5	<i>G1</i>	<i>GB</i>	<i>GG</i>	<i>G2</i>	<i>G3</i>	<i>G4</i>
7½		<i>HB</i>	<i>HG</i>	<i>H2</i>	<i>H3</i>	<i>H4</i>
10			<i>JG</i>	<i>J2</i>	<i>J3</i>	<i>J4</i>
15			<i>KG</i>	<b>K2</b>	<i>K3</i>	<i>K4</i>
20			<b>LG</b>	<i>L2</i>	<i>L3</i>	<i>L4</i>
25			<b>MG</b>	<b>M2</b>	<i>M3</i>	<b>M4</b>
30			<i>NG</i>	<b>N2</b>	<i>N3</i>	<i>N4</i>
40			<b>PG</b>	<i>P2</i>	<i>P3</i>	<i>P4</i>
50			<i>RG</i>	<b>R2</b>	<i>R3</i>	<b>R4</b>
60			<b>SG</b>	<i>S2</i>	<i>S3</i>	<i>S4</i>

Type F (Main Disc./ Motor fuses)	Type C (Main Disc./ Motor CB's)	Type G (Indiv. Fusible Disc.'s)	Type D (Indiv. CB's)
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**DESCRIPTION:**  
The Model E2 Duplex Pump Controller is a fully integrated control package for automatic pump motor sequencing, short-circuit & overload protection, and (optional) alarm annunciation required for a wide variety of pump applications. This model is specifically designed for applications using Condensate, Boiler Feed, Makeup, Sump/Sewage, Submersible, Booster, Condenser water, or Fuel Oil pumps. Control panel construction is in accordance with applicable NEC codes and is built to the highest standards of quality control & workmanship. Five Types (Power Configurations) are available and all include the standard equipment outlined below.

Seq. No.	Sequence of Operation
<u>01</u>	For pumps controlled by mechanical alternator
02	Lead-Lag operation with manual alternator
<u>03</u>	Lead-Lag/automatic alternator (Non-Submersible)
<u>04</u>	Lead-Lag/automatic alternator (Submersible floats)
<u>05</u>	Same as Seq. 4 but with Intrinsically Safe float switch circuits
06	Condenser water pumps (Changeover sequence)
07	For Duplex Fuel Oil sets; Pump foil & automatic indexing
08	Booster pumps with manual alternator
09	Booster pumps with time clock alternator
10	Booster pumps-PLC logic; incl. Press. sw's, alarms, etc.
11	Same as above (Seq. 10) but adds Low Syst. Press sw.
12	Same as above (Seq. 11) but adds 3-step sequencing
13	Condenser water pumps-PLC logic (Changeover seq.)
14	Sump/Sewage pumps with electrodes; fittings not incl.
15	Submersible pumps-PLC logic (Consult Factory for Opt's)
16	Bubbler System Level sensing - for Wet Well applications
18	Roof Fill Pumps - using mechanical floats
20	Roof Fill Pumps - using Electrode probes (Remote electrode panel & probes added separately; See Page 4)

**Explanation of Model Numbering**

<b>E2</b>	<b>F</b>	<b>4</b>	<b>D2</b>	<b>-</b>	<b>A14TA27</b>
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Duplex  
Panel TYPE (See above table)  
Sequence of Operation (See table at left on this page)  
Size ID Code (HP & Voltage) (See above table)  
Options (enter sequentially)(See Page 4)

Panel in above example includes: Common Main Disconnect, 2 sets motor fuses, 1.5HP/240v 3Ph, with automatic alternator for use with submersible floats; includes Optional high level light (Oil tight) with alarm horn & silence PB.

- Commonly used are **BOLD UNDERLINED**:
1. Add pressure switched, timers, etc. from Options Page 4.
  2. Single (common) **Flange-mtd.** Disc. Handle (instead of Thru-door) is std.

<b>STD Equipment</b> (1) NEMA 1 Enclosure (1) Magnetic Starter (1) Ambient-compen. Adj. OL relay (1) HOA sw's-NEMA 1 (1) Control Transformer	(1) Numbered terminal strip (1) Custom wiring & field connection dwg.
<b>PLUS...</b> Main disconnect or Circuit Breaker as indicated by TYPE	

**Control Panels**

Option Number	General Panel-mounted Optional Equipment	Encl. is NEMA: <sup>1</sup> 1 or 12,3R,4	Option Number	Options commonly found in Submersible Pump Panels	Encl. is NEMA: <sup>1</sup> 1 or 12,3R,4
A6	Overload trip lights		<b><u>D9</u></b>	Seal Leak light with Test PB's (Reliance motors)	
<b><u>A8</u></b>	Power ON light		<b><u>D10</u></b>	Terminals to connect motor over temp switch	SAME
<b><u>A14</u></b>	High Level alarm light		<b><u>D12</u></b>	Over temp. alarm light (auto reset)	
A19	Low Level alarm light; incl. aux. relay		D14	Over temp. light (Reset: motor/ auto light/manual)	
A22	Misc. alarm light (specify); incl. aux. relay		E33	Aux. (Pump OL trip) contacts for use with remote Model A13-05 type alarm panel	SAME
<b><u>A27</u></b>	Alarm Horn with Silence PB		<b>Option Number</b>	<b>Options commonly found in Submersible Pump Panels</b>	<b>Alarm light: NEMA:</b>
A29	Alarm Horn with Silence-Test sw.				<sup>1</sup> 1 or Oil tight
<b><u>C1T</u></b>	Oil tight HOA selectors (NEMA 1 HOA's are incl. in basic panel @ no extra charge)		H1	Phase monitor/motor shutdown relay	3
<b><u>C2</u></b>	Test-Off-Auto selector		H2	Lightning arrestor	3
C4	Misc. or Test PB (specify)		H3	Surge Capacitor	3
B1	Hour meter 0-99999.0 non-resettable	SPEC	J1	Disch. Fail alarm; incl. timer, light, reset PB	
<b><u>E1</u></b>	High Level aux. relay (5A@115VAC dry ckt)	SAME	J2	OFF float (submersible) anti-chatter timer	SAME
<b><u>E2</u></b>	Power Loss aux. relay (5A@115VAC dry ckt)	SAME	<b><u>J3</u></b>	Lag pump ON delay timer	SAME
E4	Misc. aux. relay (10A@115VAC dry ckt)	SAME	J4	Terminals to connect Redundant OFF float	SAME
F5	NEMA 12 Enclosure (See Note 1)		<b><u>J18</u></b>	Add 1-AUTO-2 alternator override switch	
F6	NEMA 3R Enclosure (See Note 1)		J23	24V Float switch circuitry (Sequence 3 or 4)	SAME
F7	NEMA 4 Enclosure (See Note 1)		<b>Number</b>	<b>Separately Mounted Controller Accessories (not included in Controller Part No. - Order sep.)</b>	
F8	NEMA 4X Enclosure (See Note 1)	SPEC	FS-3K	Set of 3 suspension-type submersible floats with bracket	
F9	Add "dead-front" inner door (See Note 1)	SAME	FP-3K	Set of 3 pipe-mtd. submersible floats with pipe support bracket	
<b><u>L1</u></b>	Add UL Panel Label (UL 508-Listing & Follow-up service)	5	R11-31	Remote electrode sensing panel (1-compartment tank type)	
<p>1 For cover devices rated for NEMA 1 service. If cover mtd. devices are on an enclosure which is NEMA 12, 3R, 4, or 4X, (or full size devices are <b>desired for appearance</b>) add suffix "T" to Option No.</p> <p>2 Items which are market "SAME" are identical regardless of enclosure NEMA Type (i.e. suffix "T" need not to be added). For items which are marked "SPEC" consult factory.</p> <p>3 1 (ONE) unit required for panels which are for applications having separate (isolated) incoming electrical feeds (Types G, D, or U), a total quantity of 2 (TWO) units are required.</p> <p>4 Commonly encountered options are <b>BOLD UNDERLINED</b> for easy reference.</p> <p>5 UL Listing of panel having a particular combination of options may not be available. Always Consult Factory for Availability. See Bulletin ED901-01A for details Options Specifications.</p>			<p>A11-01</p> <p>Single point High Level alarm remote panel with horn &amp; light</p>		
			A13-05	Fail safe (3-point) remote alarm annunciator panel; must be ordered with Controller; Controller must also include Options E1 & E2	