Oneline Diagrams

Questions and Answers

Q: What are they?

A: Oneline diagrams show how the pieces of a system fit together. They provide enough detail to understand what a system consists of without diving too far into the details.

Q: Why do we need them?

A: Understanding what is attached to an electrical system and how it works allows PVREA to evaluate the impact of connecting a member's system to ours. Insufficient information or improper operation may cause issues with the service (and possibly other services too) which can be costly to both the member and PVREA.

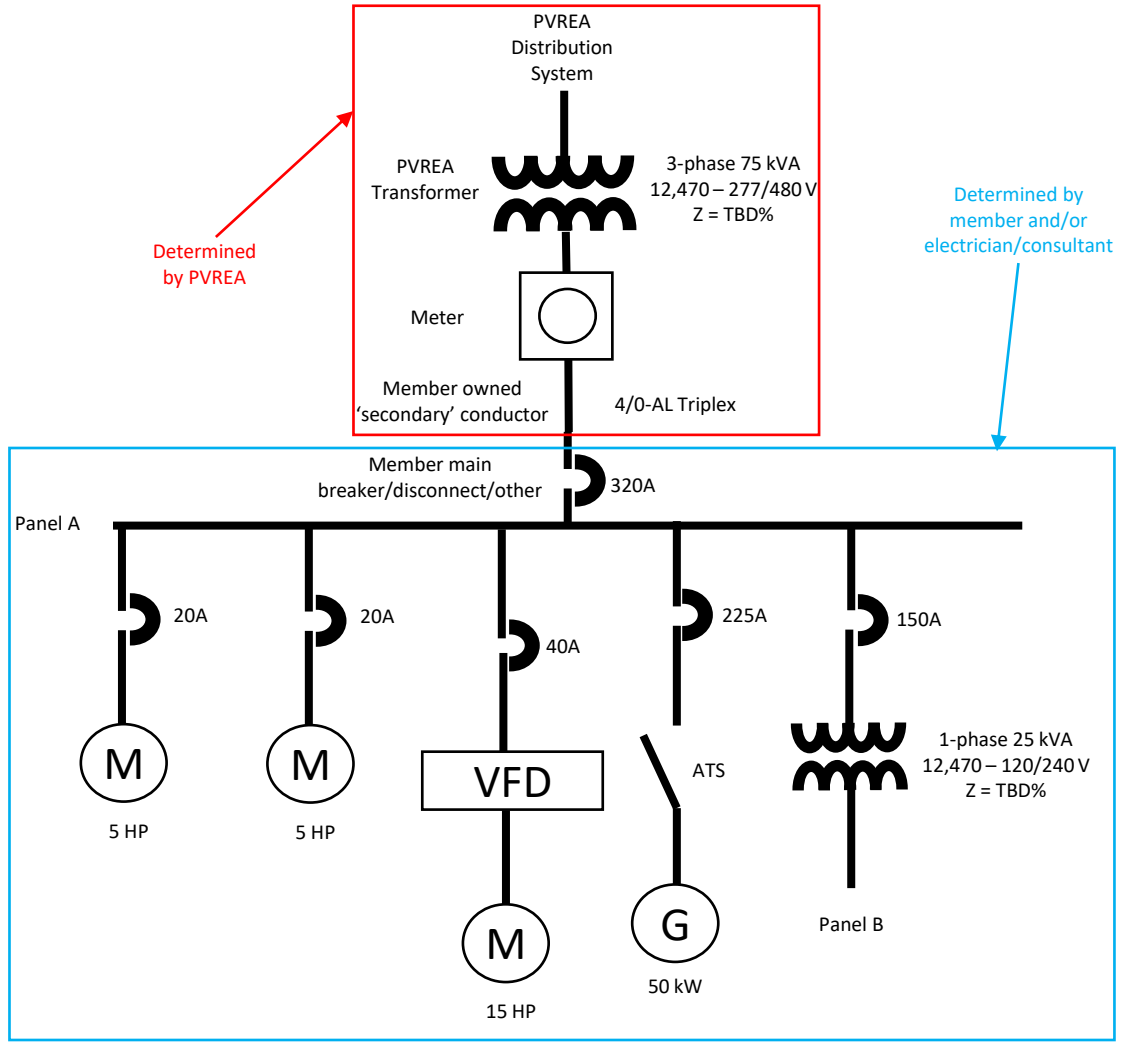
Q: How do I provide one?

A: If you have enough electrical system knowledge, it may be possible to create your own. Hand drawn onelines may be acceptable for simple systems (i.e., A new pivot.) If there is not enough information available, the utility may have questions. If you are unprepared to answer those questions, it may be best to hire a consultant (electrician or engineer) to prepare the oneline diagram for you.

Q: When are they required?

A: PVREA asks that oneline diagrams are provided for all three phase services, single phase services that are 400 Amps and larger, and as requested by system engineering.

Basic Example



Electrical Load/Panel Schedules

Questions and Answers

Q: What are they?

A: Electrical load schedules (panel schedules) describe the power which could be used by devices in the system. They are normally described in Volts and Amps, or Watts.

Q: Why do we need them?

A: These schedules help PVREA come up with an estimate on the largest amount of power likely to be used. Knowing what equipment and power requirements are connected help to size equipment to run smoothly.

Q: How do I provide one?

A: These are typically filled out by electricians and engineers.

Q: When are they required?

A: Upon request from PVREA, when a requesting large amounts of power with many types of load, or where a facility process is not familiar to PVREA's system engineering team. If the process is not familiar to the system engineering team, they may reach out for more details.

Basic Example

LOAD TYPE		CONNECTED KVA			NEC DEM FACTOR	DEMAND KVA		
		A	B	C		A	B	C
GENERAL LIGHTING		1.82	0.00	0.10	125%	2.28	0.00	0.13
GENERAL USE RECEPT		0.18	0.72	0.00	<=10 KVA@100%	0.18	0.72	0.00
					>10KVA@50%	0.00	0.00	0.00
MOTORS/HVAC	LARGEST	0.00	1.83	1.83	125%	0.00	2.29	2.29
	ALL OTHERS	0.00	0.00	0.00	100%	0.00	0.00	0.00
ELECTRIC HEAT		0.00	0.25	1.00	125%	0.00	0.31	1.25
EQUIPMENT		1.00	0.30	0.05	100%	1.00	0.30	0.05
		0.00	0.00	0.00	100%	0.00	0.00	0.00
		0.00	0.00	0.00	125%	0.00	0.00	0.00
TOTAL KVA PER PHASE		3.00	3.10	2.98		3.46	3.62	3.71
TOTAL DEMAND AMPERES PER PHASE						29	30	31
PANEL / FEEDER (TOTAL KVA)								10.79
(TOTAL KVA) X 1000 = TOTAL AMPS VOLTS X 1.732								30

Motor Information

Questions and Answers

Q: What is it?

A: Motors can be described in many ways. Common descriptions are size in horsepower, (HP) NEMA motor code, full load Amperes, what the motor is being used for, and how the motor will be started and run.

Q: Why do we need it?

A: Motors can cause visible and non-visible issues on the system if not accounted for or if they are operated in a way PVREA has deemed unacceptable.

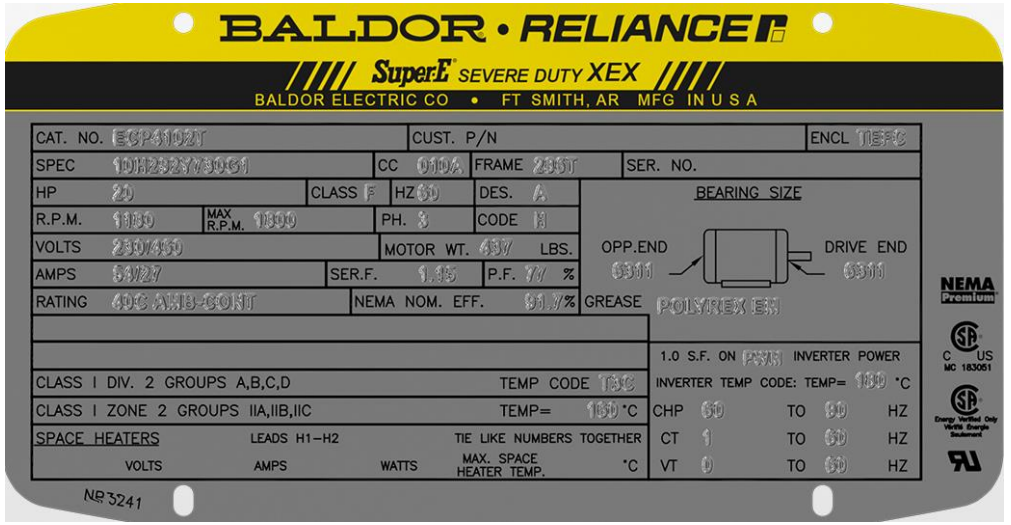
Q: How do I provide it?

A: Nameplates are typically provided with motors. The required information may also be found in the motor documentation.

Q: When is it required?

A: All motors 10 HP and larger are required to be submitted in a "Motor Data Request Form" which is reviewed by system engineering.

Typical Nameplates



Winding: 42WGW487-R001	Type: 4250M	Enclosure: OPSB

Nameplate Data				460 V, 60 Hz: Single Voltage Motor	
Rated Output (HP)	40			Full Load Torque	118 LB-FT
Volts	460			Start Configuration	direct on line
Full Load Amps	46			Breakdown Torque	375 LB-FT
R.P.M.	1775			Pull-up Torque	142 LB-FT
Hz	60	Phase	3	Locked-rotor Torque	205 LB-FT
NEMA Design Code	B	KVA Code	G	Starting Current	314 A
Service Factor (S.F.)	1.15			No-load Current	17.7 A
NEMA Nom. Eff.	94.5	Power Factor	86	Line-line Res. @ 25°C	0.155 Ω
Rating - Duty	40C AMB-CONT			Temp. Rise @ Rated Load	30°C
S.F. Amps				Temp. Rise @ S.F. Load	36°C
				Rotor inertia	6.66 LB-FT2

Load Characteristics 460 V, 60 Hz, 40 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	51	72	81	86	86	86	86
Efficiency	90.8	94.2	94.8	94.6	93.9	93.5	94.2
Speed	1793	1787	1781	1775	1768	1760	1771
Line amperes	20.4	27.6	36.4	46	57.1	68.8	52.8