

Optidrive Applications Support Library

Application Note	AN-IDL-012
Title	Use of Three Phase Drives On Single Phase Power Supply
Related Products	All Products

Introduction

The Optidrive E3 and P2 have been approved by UL for a single-phase input. This application note provides the single-phase input and output ratings of the Optidrive E3 and Optidrive P2.

UL File Number

UL File Number	E226333
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Conformity to UL Standards

When applying single-phase supply to a three-phase input ODE-3 or ODP-2 Drive the applied motor must not exceed the data specified in the tables below.

Overview

It is permissible to use selected three-phase input Optidrive E3 and Optidrive P2 (ODE-3 or ODP-2) Variable Speed Drives on single phase power supplies when certain conditions are met.

The supply range must be at the same level as the three-phase rating:

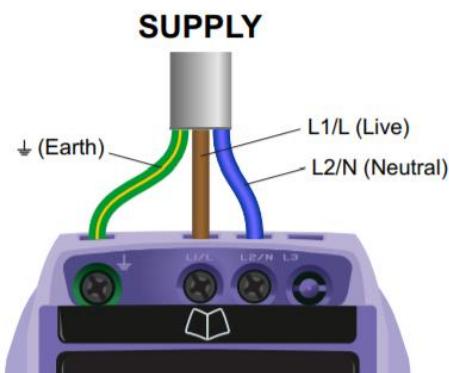
200 – 240V ±10%

380 – 480V ±10%

500 – 600V ±10%

A 50% derating must be applied to the output current of the drive.

The power connections must be connected to L1 and L2.



Circuit protection devices must be sized according to the tables in the respective manuals at the same current rating as the three-phase ratings.

Note:

It is not possible to supply Size 4 IP66 Optidrive E3 with single phase supply.

Appendix:

Below are the Input and output ratings of the Optidrive E3 and Optidrive P2 models:

	Three-phase 230V	Current	
	IP20	Input	Output
3 phase	ODE-3-120023-3012	3.4	2.3
1 phase		N/A	N/A
3 phase	ODE-3-120043-3012	5.6	4.3
1 phase		5.6	2.2
3 phase	ODE-3-120070-3012	9.5	7.0
1 phase		9.5	3.5
3 phase	ODE-3-220070-3*42	8.9	7.0
1 phase		N/A	N/A
3 phase	ODE-3-220105-3*42	12.1	10.5
1 phase		12.1	5.3
3 phase	ODE-3-320180-3*42	20.9	18.0
1 phase		20.9	9.0
3 phase	ODE-3-320240-3*42	26.4	24.0
1 phase		26.4	12.0
3 phase	ODE-3-420300-3*42	33.3	30.0
1 phase		33.3	15.0
3 phase	ODE-3-420460-3*42	50.1	46.0
1 phase		50.1	23.0
3 phase	ODE-3-520610-3*42	54.6	61.00
1 phase		N/A	N/A
3 phase	ODE-3-520720-3*42	64.8	72.0
1 phase		N/A	N/A

	Three-phase 230V	Current	
	IP66	Input	Output
3 phase	ODE-3-120023-301#	3.4	2.3
1 phase		N/A	N/A
3 phase	ODE-3-120043-301#	5.6	4.3
1 phase		5.6	2.2
3 phase	ODE-3-120070-301#	9.5	7.0
1 phase		9.5	3.5
3 phase	ODE-3-220070-3*4#	8.9	7.0
1 phase		N/A	N/A
3 phase	ODE-3-220105-3*4#	12.1	10.5
1 phase		12.1	5.3
3 phase	ODE-3-320180-3*4#	20.9	18.0
1 phase		20.9	9.0
3 phase	ODE-3-320240-3*4#	26.4	24.0
1 phase		26.4	12.0
3 phase	ODE-3-420300-3*4#	33.3	N/A
1 phase			N/A
3 phase	ODE-3-420460-3*4#	50.1	N/A

1 phase			N/A
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Three-phase 400V		Current	
	IP20	Input	Output
3 phase	ODE-3-140012-3*1#	1.7	1.2
1 phase		1.7	N/A
3 phase	ODE-3-140022-3*1#	3.5	2.2
1 phase		3.5	1.1
3 phase	ODE-3-140041-3*1#	5.6	4.1
1 phase		5.6	2.0
3 phase	ODE-3-240041-3*4#	5.6	4.1
1 phase		5.6	2.0
3 phase	ODE-3-240058-3*4#	7.5	5.8
1 phase		7.5	3.0
3 phase	ODE-3-240095-3*4#	11.5	9.5
1 phase		11.5	4.8
3 phase	ODE-3-340140-3*4#	17.2	14.0
1 phase		17.2	7.0
3 phase	ODE-3-340180-3*4#	21.2	18.0
1 phase		21.2	9.0
3 phase	ODE-3-340240-3*4#	27.5	24.0
1 phase		27.5	12.0
3 phase	ODE-3-440300-3*4#	34.2	30.0
1 phase		34.2	15.0
3 phase	ODE-3-440390-3*4#	44.1	39.0
1 phase		44.1	19.0
3 phase	ODE-3-440460-3*4#	51.9	46.0
1 phase		51.9	23.0
3 phase	ODE-3-540610-3*4#	56.3	61.0
1 phase		56.3	N/A
3 phase	ODE-3-540720-3*4#	67.6	72.0
1 phase		67.6	N/A

Three-phase 400V		Current	
	IP66	Input	Output
3 phase	ODE-3-140012-3*1#	1.7	1.2
1 phase		1.7	N/A
3 phase	ODE-3-140022-3*1#	3.5	2.2
1 phase		3.5	1.1
3 phase	ODE-3-140041-3*4#	5.6	4.1
1 phase		5.6	2.0
3 phase	ODE-3-240041-3*4#	5.6	4.1
1 phase		5.6	2.0
3 phase	ODE-3-240058-3*4#	7.5	5.8
1 phase		7.5	3.0
3 phase	ODE-3-240095-3*4#	11.5	9.5

1 phase		103.6	45.0
3 phase	ODP-2-62030-3KF4N	126.7	110.0
1 phase		126.7	55.0
3 phase	ODP-2-62037-3KF4N	172.7	150.0
1 phase		172.7	75.0
3 phase	ODP-2-62045-3KF4N	183.3	172.0
1 phase		183.3	86.0
3 phase	ODP-2-72055-3KF4N	205.7	202.0
1 phase		205.7	101.0
3 phase	ODP-2-72075-3KF4N	255.5	248.0
1 phase		255.5	124.0

Three-phase 230V		Current	
	IP20	Input	Output
3 phase	ODP-2-22075-3KF42	5.1	4.3
1 phase		5.1	2.2
3 phase	ODP-2-22150-3KF42	8.3	7.0
1 phase		8.3	3.5
3 phase	ODP-2-22220-3KF42	12.6	10.2
1 phase		12.6	5.1
3 phase	ODP-2-32040-3KF42	21.6	18.0
1 phase		21.6	9.0
3 phase	ODP-2-32055-3KF42	29.1	24.0
1 phase		29.1	12.0
3 phase	ODP-2-42075-3KF42	36.4	39.0
1 phase		36.4	19.0
3 phase	ODP-2-42110-3KF42	55.8	46.0
1 phase		55.8	23.0
3 phase	ODP-2-52150-3KF42	70.2	61.0
1 phase		70.2	30.0
3 phase	ODP-2-52185-3KF42	82.9	72.0
1 phase		82.9	36.0
3 phase	ODP-2-62022-3KF42	103.6	90.0
1 phase		103.6	45.0
3 phase	ODP-2-62030-3KF42	126.7	110.0
1 phase		126.7	55.0
3 phase	ODP-2-62037-3KF42	172.7	150.0
1 phase		172.7	75.0
3 phase	ODP-2-62045-3KF42	183.3	180.0
1 phase		183.3	90.0

Three-phase 400V		Current	
	IP66	Input	Output
3 phase	ODP-2-24075-3KF4#	2.4	2.2
1 phase		2.4	1.1
3 phase	ODP-2-24150-3KF4#	5.1	4.1
1 phase		5.1	2.1
3 phase	ODP-2-24220-3KF4#	7.5	5.8
1 phase		7.5	3.0
3 phase	ODP-2-24400-3KF4#	11.2	9.5
1 phase		11.2	4.8
3 phase	ODP-2-34055-3KF4#	19.0	14.0
1 phase		19.0	7.0
3 phase	ODP-2-34075-3KF4#	21.0	18.0
1 phase		21.0	9.0

Three-phase 400V		Current	
	IP55	Input	Output
3 phase	ODP-2-44110-3KF4N	28.9	24.0
1 phase		28.9	12.0
3 phase	ODP-2-44150-3KF4N	37.2	30.0
1 phase		37.2	15.0
3 phase	ODP-2-44185-3KF4N	47.0	39.0
1 phase		47.0	19.0
3 phase	ODP-2-44220-3KF4N	52.4	46.0
1 phase		52.4	23.0
3 phase	ODP-2-54300-3KF4N	63.8	61.0
1 phase		63.8	30.0
3 phase	ODP-2-54370-3KF4N	76.4	72.0
1 phase		76.4	36.0
3 phase	ODP-2-64045-3KF4N	92.2	90.0
1 phase		92.2	45.0
3 phase	ODP-2-64055-3KF4N	112.5	110.0
1 phase		112.5	55.0
3 phase	ODP-2-64075-3KF4N	153.2	150.0
1 phase		153.2	75.0
3 phase	ODP-2-64090-3KF4N	183.7	180.0
1 phase		183.7	90.0
3 phase	ODP-2-74110-3KF4N	205.9	202.0
1 phase		205.9	101.0
3 phase	ODP-2-74132-3KF4N	244.5	240.0
1 phase		244.5	120.0
3 phase	ODP-2-74160-3KF4N	307.8	302.0
1 phase		307.8	151.0

Three-phase 400V	Current
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	IP20	Input	Output
3 phase	ODP-2-24075-3KF42	3.1	2.2
1 phase		3.1	1.1
3 phase	ODP-2-24150-3KF42	4.8	4.1
1 phase		4.8	2.1
3 phase	ODP-2-24220-3KF42	7.2	5.8
1 phase		7.2	3.0
3 phase	ODP-2-24400-3KF42	10.8	9.5
1 phase		10.8	4.8
3 phase	ODP-2-34055-3KF42	13.3	14.0
1 phase		13.3	7.0
3 phase	ODP-2-34075-3KF42	18.5	18.0
1 phase		18.5	9.0
3 phase	ODP-2-34110-3KF42	26.0	24.0
1 phase		26.0	12.0
3 phase	ODP-2-44150-3KF42	37.2	30.0
1 phase		37.2	15.0
3 phase	ODP-2-44185-3KF42	47.0	39.0
1 phase		47.0	19.0
3 phase	ODP-2-44220-3KF42	52.4	46.0
1 phase		52.4	23.0
3 phase	ODP-2-54300-3KF42	63.8	61.0
1 phase		63.8	30.0
3 phase	ODP-2-54370-3KF42	76.4	72.0
1 phase		76.4	36.0
3 phase	ODP-2-64045-3KF42	92.2	90.0
1 phase		92.2	45.0
3 phase	ODP-2-64055-3KF42	112.5	110.0
1 phase		112.5	55.0
3 phase	ODP-2-64075-3KF42	153.2	150.0
1 phase		153.2	75.0
3 phase	ODP-2-64090-3KF42	183.7	180.0
1 phase		183.7	90.0
3 phase	ODP-2-84200-3KF42 (Non UL)	370.0	370.0
1 phase	(Non UL)	370.0	185.0
3 phase	ODP-2-84250-3KF42 (Non UL)	450.0	450.0
1 phase	(Non UL)	450.0	225

Three-phase 600V		Current	
	IP66	Input	Output
3 phase	ODP-2-26075-3K04#	2.5	2.1
1 phase		2.5	1.0
3 phase	ODP-2-26150-3K04#	3.7	3.1
1 phase		3.7	1.5
3 phase	ODP-2-26220-3K04#	4.9	4.1

1 phase		4.9	2.0
3 phase	ODP-2-26400-3K04#	7.8	6.5
1 phase		7.8	3.2
3 phase	ODP-2-26550-3K04#	10.8	9.0
1 phase		10.8	4.5
3 phase	ODP-2-36075-3K04#	14.4	12.0
1 phase		14.4	6.0
3 phase	ODP-2-36110-3K04#	20.6	17.0
1 phase		20.6	8.5

Three-phase 600V		Current	
	IP55	Input	Output
3 phase	ODP-2-46150-3K04N	26.7	22.0
1 phase		26.7	11.0
3 phase	ODP-2-46185-3K04N	34	28.0
1 phase		34	16.0
3 phase	ODP-2-46220-3K04N	41.2	34.0
1 phase		41.2	17.0
3 phase	ODP-2-46300-3K04N	49.5	43.0
1 phase		49.5	21.5
3 phase	ODP-2-56370-3K04N	62.2	54.0
1 phase		62.2	27.0
3 phase	ODP-2-56045-3K04N	75.8	65.0
1 phase		75.8	32.5
3 phase	ODP-2-66055-3K04N	90.9	78.0
1 phase		90.9	39.0
3 phase	ODP-2-66075-3K04N	108.2	105.0
1 phase		108.2	52.5
3 phase	ODP-2-66090-3K04N	127.7	130.0
1 phase		127.7	65.0
3 phase	ODP-2-66110-3K04N	160	150.0
1 phase		160	75.0

Three-phase 600V		Current	
	IP20	Input	Output
3 phase	ODP-2-26075-3K042	2.5	2.1
1 phase		2.5	1.0
3 phase	ODP-2-26150-3K042	3.7	3.1
1 phase		3.7	1.5
3 phase	ODP-2-26220-3K042	4.9	4.1
1 phase		4.9	2.0
3 phase	ODP-2-26400-3K042	7.8	6.5
1 phase		7.8	3.2
3 phase	ODP-2-26550-3K042	10.8	9.0
1 phase		10.8	4.5

3 phase	ODP-2-36075-3K042	14.4	12.0
1 phase		14.4	6.0
3 phase	ODP-2-36110-3K042	20.6	17.0
1 phase		20.6	8.5
3 phase	ODP-2-36150-3K042	26.7	22.0
1 phase		26.7	11.0
3 phase	ODP-2-46185-3K042	34	28.0
1 phase		34	16.0
3 phase	ODP-2-46220-3K042	41.2	34.0
1 phase		41.2	17.0
3 phase	ODP-2-46300-3K042	49.5	43.0
1 phase		49.5	21.5
3 phase	ODP-2-56370-3K042	62.2	54.0
1 phase		62.2	27.0
3 phase	ODP-2-56045-3K042	75.8	65.0
1 phase		75.8	32.5

Three-phase 230V		Current	
	IP66	Input	Output
3 phase	ODP-2-22010-3HF4#	5.7	4.3
1 phase		5.7	2.2
3 phase	ODP-2-22020-3HF4#	8.4	7.0
1 phase		8.4	3.5
3 phase	ODP-2-22030-3HF4#	13.1	10.2
1 phase		13.1	5.1
3 phase	ODP-2-32050-3HF4#	18.5	18.0
1 phase		18.5	9.0
3 phase	ODP-2-32075-3HF4#	25	24.0
1 phase		25	12.0

Three-phase 230V		Current	
	IP55	Input	Output
3 phase	ODP-2-42075-3HF4#	25	24.0
1 phase		25	12.0
3 phase	ODP-2-42100-3HF4#	36.2	39.0
1 phase		36.2	19.0
3 phase	ODP-2-42150-3HF4#	42	46.0
1 phase		42	23.0
3 phase	ODP-2-52020-3HF4#	69.6	61.0
1 phase		69.6	30.0
3 phase	ODP-2-52025-3HF4#	76.9	72.0
1 phase		76.9	36.0
3 phase	ODP-2-62030-3HF4#	92	90.0

1 phase		92	45.0
3 phase	ODP-2-62040-3HF4#	116.9	110.0
1 phase		116.9	55.0
3 phase	ODP-2-62050-3HF4#	150.2	150.0
1 phase		150.2	75.0
3 phase	ODP-2-62060-3HF4#	171	172.0
1 phase		171	86.0
3 phase	ODP-2-72075-3HF4#	211	202.0
1 phase		211	101.0
3 phase	ODP-2-72110-3HF4#	251	248.0
1 phase		251	124.0

Three-phase 230V		Current	
	IP20	Input	Output
3 phase	ODP-2-22010-3HF4#	5.1	4.3
1 phase		5.1	2.2
3 phase	ODP-2-22020-3HF4#	8.3	7.0
1 phase		8.3	3.5
3 phase	ODP-2-22030-3HF4#	12.6	10.2
1 phase		12.6	5.1
3 phase	ODP-2-32050-3HF4#	21.6	18.0
1 phase		21.6	9.0
3 phase	ODP-2-32075-3HF4#	29.1	24.0
1 phase		29.1	12.0
3 phase	ODP-2-42100-3HF4#	36.4	39.0
1 phase		36.4	19.0
3 phase	ODP-2-52150-3HF4#	55.8	46.0
1 phase		55.8	23.0
3 phase	ODP-2-52020-3HF4#	70.2	61.0
1 phase		70.2	30.0
3 phase	ODP-2-52025-3HF4#	82.9	72.0
1 phase		82.9	36.0
3 phase	ODP-2-62030-3HF4#	103.6	90.0
1 phase		103.6	45.0
3 phase	ODP-2-62040-3HF4#	126.7	110.0
1 phase		126.7	55.0
3 phase	ODP-2-62050-3HF4#	172.7	150.0
1 phase		172.7	75.0
3 phase	ODP-2-62060-3HF4#	183.3	180.0
1 phase		183.3	90.0

Three-phase 400V		Current	
	IP66	Input	Output
3 phase	ODP-2-24010-3HF4#	2.4	2.2
1 phase		2.4	1.1

3 phase	ODP-2-24020-3HF4#	5.1	4.1
1 phase		5.1	2.1
3 phase	ODP-2-24030-3HF4#	7.5	5.8
1 phase		7.5	3.0
3 phase	ODP-2-24050-3HF4#	11.2	9.5
1 phase		11.2	4.8
3 phase	ODP-2-34075-3HF4#	19.0	14.0
1 phase		19.0	7.0
3 phase	ODP-2-34100-3HF4#	21.0	18.0
1 phase		21.0	9.0

Three-phase 400V		Current	
	IP55	Input	Output
3 phase	ODP-2-44150-3HF4#	28.9	24.0
1 phase		28.9	12.0
3 phase	ODP-2-44200-3HF4#	37.2	30.0
1 phase		37.2	15.0
3 phase	ODP-2-44250-3HF4#	47.0	39.0
1 phase		47.0	19.0
3 phase	ODP-2-44300-3HF4#	52.4	46.0
1 phase		52.4	23.0
3 phase	ODP-2-54040-3HF4#	63.8	61.0
1 phase		63.8	30.0
3 phase	ODP-2-54050-3HF4#	76.4	72.0
1 phase		76.4	36.0
3 phase	ODP-2-64060-3HF4#	92.2	90.0
1 phase		92.2	45.0
3 phase	ODP-2-64075-3HF4#	112.5	110.0
1 phase		112.5	55.0
3 phase	ODP-2-64100-3HF4#	153.2	150.0
1 phase		153.2	75.0
3 phase	ODP-2-64150-3HF4#	183.7	180.0
1 phase		183.7	90.0
3 phase	ODP-2-74175-3HF4#	205.9	202.0
1 phase		205.9	101.0
3 phase	ODP-2-74200-3HF4#	244.5	240.0
1 phase		244.5	120.0
3 phase	ODP-2-74250-3HF4#	307.8	302.0
1 phase		307.8	151.0

Three-phase 400V		Current	
	IP20	Input	Output
3 phase	ODP-2-24010-3HF4#	3.1	2.2
1 phase		3.1	1.1
3 phase	ODP-2-24020-3HF4#	4.8	4.1
1 phase		4.8	2.1

3 phase	ODP-2-24030-3HF4#	7.2	5.8
1 phase		7.2	3.0
3 phase	ODP-2-24050-3HF4#	10.8	9.5
1 phase		10.8	4.8
3 phase	ODP-2-34075-3HF4#	13.3	14.0
1 phase		13.3	7.0
3 phase	ODP-2-34100-3HF4#	18.5	18.0
1 phase		18.5	9.0
3 phase	ODP-2-34150-3HF4#	26.0	24.0
1 phase		26.0	12.0
3 phase	ODP-2-44200-3HF4#	37.2	30.0
1 phase		37.2	15.0
3 phase	ODP-2-44250-3HF4#	47.0	39.0
1 phase		47.0	19.0
3 phase	ODP-2-44300-3HF4#	52.4	46.0
1 phase		52.4	23.0
3 phase	ODP-2-54040-3HF4#	63.8	61.0
1 phase		63.8	30.0
3 phase	ODP-2-54050-3HF4#	76.4	72.0
1 phase		76.4	36.0
3 phase	ODP-2-64060-3HF4#	92.2	90.0
1 phase		92.2	45.0
3 phase	ODP-2-64075-3HF4#	112.5	110.0
1 phase		112.5	55.0
3 phase	ODP-2-64100-3HF4#	153.2	150.0
1 phase		153.2	75.0
3 phase	ODP-2-64150-3HF4#	183.7	180.0
1 phase		183.7	90.0
3 phase	ODP-2-84300-3HF4# (Non UL)	370.0	370.0
1 phase	(Non UL)	370.0	185.0
3 phase	ODP-2-84350-3HF4# (Non UL)	450.0	450.0
1 phase	(Non UL)	450.0	225

Three-phase 600V		Current	
	IP66	Input	Output
3 phase	ODP-2-26075-3H04#	2.5	2.1
1 phase		2.5	1.0
3 phase	ODP-2-26150-3H04#	3.7	3.1
1 phase		3.7	1.5
3 phase	ODP-2-26220-3H04#	4.9	4.1
1 phase		4.9	2.0
3 phase	ODP-2-26400-3H04#	7.8	6.5
1 phase		7.8	3.2
3 phase	ODP-2-26550-3H04#	10.8	9.0
1 phase		10.8	4.5

3 phase	ODP-2-36075-3H04#	14.4	12.0
1 phase		14.4	6.0
3 phase	ODP-2-36110-3H04#	20.6	17.0
1 phase		20.6	8.5

Three-phase 600V		Current	
	IP55	Input	Output
3 phase	ODP-2-46150-3H04#	26.7	22.0
1 phase		26.7	11.0
3 phase	ODP-2-46185-3H04#	34	28.0
1 phase		34	16.0
3 phase	ODP-2-46220-3H04#	41.2	34.0
1 phase		41.2	17.0
3 phase	ODP-2-46300-3H04#	49.5	43.0
1 phase		49.5	21.5
3 phase	ODP-2-56370-3H04#	62.2	54.0
1 phase		62.2	27.0
3 phase	ODP-2-56045-3H04#	75.8	65.0
1 phase		75.8	32.5
3 phase	ODP-2-66055-3H04#	90.9	78.0
1 phase		90.9	39.0
3 phase	ODP-2-66075-3H04#	108.2	105.0
1 phase		108.2	52.5
3 phase	ODP-2-66090-3H04#	127.7	130.0
1 phase		127.7	65.0
3 phase	ODP-2-66110-3H04#	160	150.0
1 phase		160	75.0

Three-phase 600V		Current	
	IP20	Input	Output
3 phase	ODP-2-26075-3H04#	2.5	2.1
1 phase		2.5	1.0
3 phase	ODP-2-26150-3H04#	3.7	3.1
1 phase		3.7	1.5
3 phase	ODP-2-26220-3H04#	4.9	4.1
1 phase		4.9	2.0
3 phase	ODP-2-26400-3H04#	7.8	6.5
1 phase		7.8	3.2
3 phase	ODP-2-26550-3H04#	10.8	9.0
1 phase		10.8	4.5
3 phase	ODP-2-36075-3H04#	14.4	12.0
1 phase		14.4	6.0
3 phase	ODP-2-36110-3H04#	20.6	17.0
1 phase		20.6	8.5
3 phase	ODP-2-36150-3H04#	26.7	22.0
1 phase		26.7	11.0

3 phase	ODP-2-46185-3H04#	34	28.0
1 phase		34	16.0
3 phase	ODP-2-46220-3H04#	41.2	34.0
1 phase		41.2	17.0
3 phase	ODP-2-46300-3H04#	49.5	43.0
1 phase		49.5	21.5
3 phase	ODP-2-56370-3H04#	62.2	54.0
1 phase		62.2	27.0
3 phase	ODP-2-56045-3H04#	75.8	65.0
1 phase		75.8	32.5
	X-TN	IP66 - OLED Display	
	Y-TN	IP66 Switched - OLED Display	

Revision History

Issue	Comments	Author	Date
01	New Document Release	CJ	20/03/2020
02	Added UL file information	RG	30/04/2020