

PA - (Penelec, Met-Ed, West Penn Power, Penn Power) IEEE 1547-2018 Default Smart Inverter Settings

Starting 1/8/24, the settings presented below are required to be installed on all inverters certified under UL-1741-SB and interconnecting to the distribution system.

The settings are intended to conform to IEEE 1547-2018. Settings other than these defaults, within the ranges of allowable settings in IEEE 1547-2018, may be required on a case-by-case basis and are subject to review and approval.

Note, if you are installing a UL-1741-SA certified inverter that doesn't yet have UL-1741-SB certification, you may continue utilizing IEEE 1547-2003, or IEEE 1547a-2014 compliant settings with all grid support functions disabled.

Bulk Power System Settings¹

Performance Category	III
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Frequency Disturbance Trip

OF2 Frequency (Hz)	62
OF2 Clearing Time (t)	0.16
OF1 Frequency (Hz)	61.2
OF1 Clearing Time (t)	300
UF1 Frequency (Hz)	58.5
UF1 Clearing Time (t)	300
UF2 Frequency (Hz)	56.5
UF2 Clearing Time (t)	0.16

Frequency Droop

dbOF (Hz)	0.036
dbUF (Hz)	0.036
kOF (p.u.)	0.05
kUF (p.u.)	0.05
Open Loop Response Time (s)	5

¹ All parameter labels below are defined in IEEE-1547.1-2020

Voltage Disturbance Trip

OV2 Voltage (V)	1.2
OV2 Clearing Time (t)	0.16
OV1 Voltage (V)	1.1
OV1 Clearing Time (t)	2.0
UV1 Voltage (V)	0.88
UV1 Clearing Time (t)	2.0
UV2 Voltage (V)	0.5
UV2 Clearing Time (t)	0.32

Enter Service Criteria

Frequency Minimum (Hz)	59.5
Frequency Maximum (Hz)	60.1
Voltage Minimum (p.u.)	0.917
Voltage Maximum (p.u.)	1.05
Enter Service Delay (s)	300
Randomized Delay (s)	300
Ramp Time – Enter Service Period (s)	300

Voltage Support Settings

Performance Category	B
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Constant Power Factor

Constant Power Factor Mode	Disabled
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Constant Reactive Power

Constant Reactive Power Mode	Disabled
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Volt-Reactive (Volt-Var)

Voltage-Reactive Power Mode	Enabled
Voltage Reference - Vref (p.u.)	1.02
Autonomous Vref Adjustment Mode	Disabled
Volt-Var Point V2 Setting (p.u. Nameplate Vnom.)	0.99
Volt-Var Point Q2 Setting (p.u. Nameplate Vmax)	0

Volt-Var Point V3 Setting (p.u. Nameplate Vnom.)	1.05
Volt-Var Point Q3 Setting (p.u. Nameplate VMax)	0
Volt-Var Point V1 Setting (p.u. Nameplate Vnom.)	0.95
Volt-Var Point Q1 Setting (p.u. Nameplate VMax)	0
Volt-Var Point V4 Setting (p.u. Nameplate Vnom.)	1.09
Volt-Var Point Q4 Setting (p.u. Nameplate VMax)	-0.44
Volt-Var Open Loop Response Time (s)	5.0

Voltage-Active Power (Volt-Watt)

Volt-Active Power Mode	Disable
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Required Default Settings in the EPRI Common File Format²

(Comma Separated Variables (CSV) file is available for download at <https://www.firstenergycorp.com/feconnect.html>)

PARAMETER	VALUE
NP_P_MAX-SS	
NP_P_MAX_OVER_PF-SS	
NP_OVER_PF-SS	
NP_P_MAX_UNDER_PF-SS	
NP_UNDER_PF-SS	
NP_VA_MAX-SS	
NP_Q_MAX_INJ-SS	
NP_Q_MAX_ABS-SS	
NP_P_MAX_CHARGE-SS	
NP_APPARENT_POWER_CHARGE_MAX-SS	
NP_AC_V_NOM-SS	
AP_LIMIT_ENABLE-SS	
AP_LIMIT-SS	
ES_PERMIT_SERVICE-SS	ENABLED
ES_V_LOW-SS	0.917
ES_V_HIGH-SS	1.05
ES_F_LOW-SS	59.5

² EPRI – Common File Format for DER Settings Exchange and Storage, Version 2, September 2022 Technical update. Product ID # 3002025445

ES_F_HIGH-SS	60.1
ES_DELAY-SS	300
ES_RANDOMIZED_DELAY-SS	300
ES_RAMP_RATE-SS	300
CONST_PF_MODE_ENABLE-SS	DISABLED
CONST_PF_EXCITATION-SS	
CONST_PF-SS	
CONST_Q_MODE_ENABLE-SS	DISABLED
CONST_Q-SS	
QV_MODE_ENABLE-SS	ENABLED
QV_VREF-SS	1.02
QV_VREF_AUTO_MODE-SS	DISABLED
QV_VREF_TIME-SS	
QV_CURVE_V2-SS	0.99
QV_CURVE_Q2-SS	0
QV_CURVE_V3-SS	1.05
QV_CURVE_Q3-SS	0
QV_CURVE_V1-SS	0.95
QV_CURVE_Q1-SS	0
QV_CURVE_V4-SS	1.09
QV_CURVE_Q4-SS	-0.44
QV_OLRT-SS	5
QP_MODE_ENABLE-SS	DISABLED
QP_CURVE_P3_GEN-SS	
QP_CURVE_P2_GEN-SS	
QP_CURVE_P1_GEN-SS	
QP_CURVE_P1_LOAD-SS	
QP_CURVE_P2_LOAD-SS	
QP_CURVE_P3_LOAD-SS	
QP_CURVE_Q3_GEN-SS	
QP_CURVE_Q2_GEN-SS	
QP_CURVE_Q1_GEN-SS	
QP_CURVE_Q1_LOAD-SS	
QP_CURVE_Q2_LOAD-SS	
QP_CURVE_Q3_LOAD-SS	
PV_MODE_ENABLE-SS	DISABLED
PV_CURVE_V1-SS	
PV_CURVE_P1-SS	
PV_CURVE_V2-SS	
PV_CURVE_P2-SS	
PV_OLRT-SS	
OV2_TRIP_V-SS	1.2
OV2_TRIP_T-SS	0.16

OV1_TRIP_V-SS	1.1
OV1_TRIP_T-SS	2
UV1_TRIP_V-SS	0.88
UV1_TRIP_T-SS	2
UV2_TRIP_V-SS	0.5
UV2_TRIP_T-SS	0.32
OF2_TRIP_F-SS	62
OF2_TRIP_T-SS	0.16
OF1_TRIP_F-SS	61.2
OF1_TRIP_T-SS	300
UF1_TRIP_F-SS	58.5
UF1_TRIP_T-SS	300
UF2_TRIP_F-SS	56.5
UF2_TRIP_T-SS	0.16
PF_DBOF-SS	0.036
PF_DBUF-SS	0.036
PF_KOF-SS	0.05
PF_KUF-SS	0.05
PF_OLRT-SS	5
MC_HVRT_V1-SS	
MC_LVRT_V1-SS	

12/19/23 - Initial Release