Signal list for wind power plants - TR 3.2.5:2015

Revision: 1 **date:** 07.01.2015

				Rated output										
A	**B**	**C**	**D**	**Signal description**	**Comments**	**Possible interval**	**Recommended value**	**Unit**	**Type of data**	**Purpose**	**Typical operator**	**Typical user**	**Energinet.dk reference**
		X	X	Grid disconnection in POC Swich gear status in plant infrastructure	Open/closed	Open/closed	-	-	Status	Monitor coupling state for wind power plants and infrastructure of units/plants	-	PBR, Electricity supply undertaking	TR 5.8.1
		X	X	Active power supplied by wind power station in POC	Active power control	0 - Pn	-	kW	Metering	Input for active power regulation	-	PBR, Electricity supply undertaking	TR 5.8.1
		X	X	Active power regulation - activated/deactivated	Active power control	Active/inactive	Active	-	Status	Monitor the electricity system	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Active power regulation - gradient for upward and downward regulation	Active power control	dP/dt	100 kW/s	kW/second	Set point	Check the speed for upward and downward regulation	PBR	PBR	TR 3.2.5
		X	X	Active power regulation - requested active power in POC	Active power control	0 - Pn	-	kW	Set point	Check the active power generated by the wind power plant	PBR	PBR	TR 3.2.5
		X	X	Reactive power - import/export in POC	Active power control	Q_{MAX} to Q_{MIN}	-	kvar	Metering	Input for reactive power egulation	-	PBR, Electricity supply undertaking	TR 5.8.1
		X	X	Power factor - measured in POC	Reactive power control	0 - 1	-	-	Metering	Input for reactive power regulation	-	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Power factor - requested power factor in POC	Reactive power control	0 - 1	1	-	Set point	Power factor control	Electricity supply undertaking	PBR,Electricity supply undertaking	TR 3.2.5
		X	X	Reactive power regulation - activated/deactivated	Reactive power control	Active/inactive	Active	-	Status	Monitor control for reactive compensation	PBR	PBR	TR 3.2.5
		X	X	Reactive power regulation - requested reactive power in POC	Reactive power control	Q_{MAX} to Q_{MIN}	0	kvar	Set point	Mvar control	PBR	PBR	TR 3.2.5
		X	X	Voltage in the voltage reference point	Voltage control	0 - U_C +15%	-	V	Metering	Input for voltage control in POC	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 5.8.1
		X	X	Voltage control - active/inactive	Voltage control	Active/inactive	Inactive	-	Status	Monitor voltage control	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Voltage in voltage reference point	Voltage control	0 - U_C +15%	-	V	Metering	Monitor voltage mode in wind power plant	-	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Voltage control - droop for voltage control	Voltage control	2 - 8%	6%	% of Un	Set point	Droop for voltage control in the voltage reference point	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Voltage regulation - requested voltage in the voltage reference point	Voltage control	U_C +/-10%	-	V	Set point	Voltage control	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5
X	X	X	X	Frequency response - activated/deactivated	Frequency response	Active/inactive	-	-	Status	Provide frequency support in overfrequency	-	PBR, Electricity supply undertaking	TR 3.2.5
X	X	X	X	Frequency response - start frequency for downward regulation - f_R	Frequency response	50.000 - 52.000	51.5	Hz	Set point	Provide frequency support in overfrequency	-	PBR, Electricity supply undertaking	TR 3.2.5
X	X	X	X	Frequency response - droop for downward regulation from f_R	Frequency response	0 - 100%	40%	% of P_n /Hz	Set point	Provide frequency support in overfrequency	-	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - activated/deactivated	Frequency control	Active/inactive	-	-	Status	Monitor frequency control	-	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - regulation limit - low frequency	Frequency control	46.50 - 47.50	47.0	Hz	Set point	Lower control limit value for frequency control	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - regulation limit - high frequency	Frequency control	51.5 - 53	52.0	Hz	Set point	Upper control limit value for frequency control	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - regulation reserve - P_{delta}	Delta control	0 - Pn	20% of Pn	kW	Set point	Input for frequency control in POC	PBA	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - start frequency for control band - f_1	Frequency control	49.750 - 50,.00	49.8	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - droop for upward regulation from f_2 to f_1	Frequency control	0 - 50%	4%	% of Pn/Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - start frequency for dead band - f_2	Frequency control	49.800 - 50.000	49.88	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - end frequency for dead band - f_3	Frequency control	50.000 - 50.200	50.02	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - end frequency for control band - f_4	Frequency control	50.000 - 50.250	50.2	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - end frequency for regulation up to f_5	Frequency control	50.000 - 51.700	50.5	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - droop for downward regulation from f_4 to f_5	Frequency control	0 - 50%	6%	% of Pn/Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - end frequency for regulation up to f_6	Frequency control	51.100 - 50.300	50.2	Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - droop for downward regulation from f_5 to f_6	Frequency control	0-50%	6%	% of Pn/Hz	Set point	Input for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Frequency control - frequency limit for reclosure if active power is reduced to below Pmin - f_7	Frequency control	50.000 - 50.100	50.05	Hz	Set point	Input for frequency control in POC	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	Pmin	Frequency control	0 - 20%	10%	-	Set point	Lower limit for frequency control in POC	PBR	PBR, Electricity supply undertaking	TR 3.2.5
		X	X	System protection	Protection	Active/inactive	Inactive	-	Control	Activation/deactivation of system protection feature	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5
X	X	X	X	Stop signal	Protection	Active/inactive	Inactive	-	Control	Activation/deactivation of stop signal	Electricity supply undertaking	PBA, Electricity supply undertaking	TR 3.2.5
X	X	X	X	On hold signal - released for start	Protection	Active/inactive	Inactive	-	Control	Activation/deactivation of reclosure	Electricity supply undertaking	PBR, Electricity supply undertaking	TR 3.2.5