Nonstandard mains/bus voltage measuring

April 2008

Application sheet

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Aim of this Application Sheet

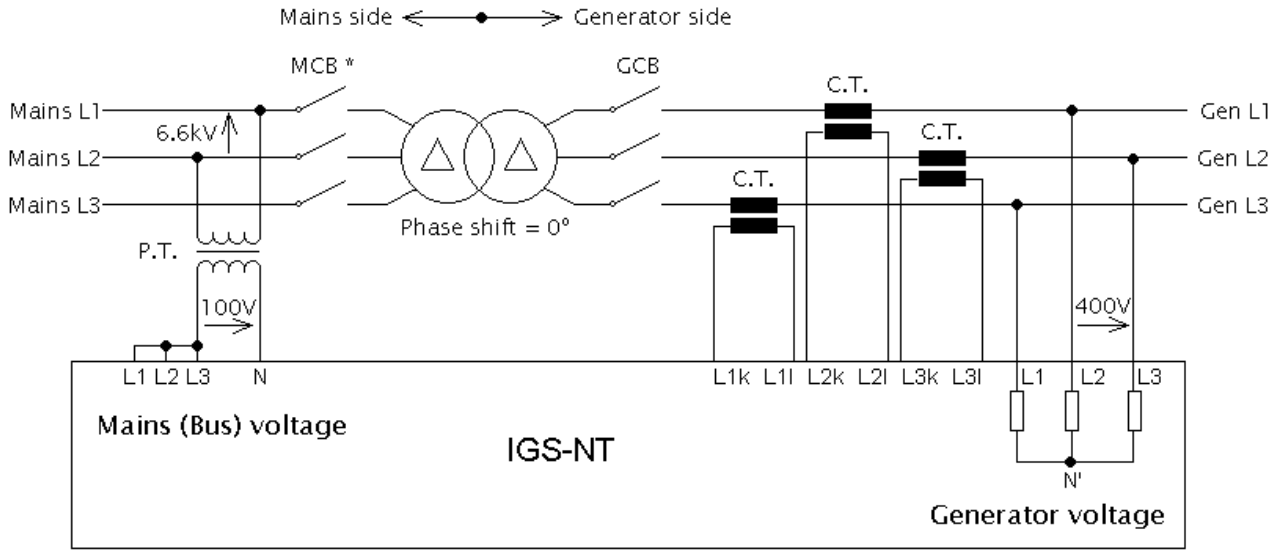
The aim of this application sheet is to help you to deal with:

- transformer which is connected between the mains (bus) side and generator side of a genset
- only one P.T. transformer is available on the high voltage mains (bus) side

Recommended connections

a) One P.T. transformer, transformer phase shift 0º

Transformer with phase shift 0º is connected between the mains side and the generator side, the P.T. transformer is connected between phase L1 and L2. Recommended controller terminals connection is available on the next picture:



Controller terminals connection I

* This picture is related to the SPtM application, there is no MCB in case of the MINT or the SPI application.

Recommended setpoints setting
It is necessary to set the mains nominal Ph-Ph voltage to 11 431V, because the real Ph-Ph voltage (6600V) is connected between the phase inputs L1, L2, L3 and neutral conductor N (see the picture Controller terminals connection I):

$$MainsNomVph-ph = \sqrt{3} \cdot MainsNomV = \sqrt{3} \cdot 6600 = 11431\,\mathrm{V}$$

Recommended setting of setpoints of the Basic settings group:

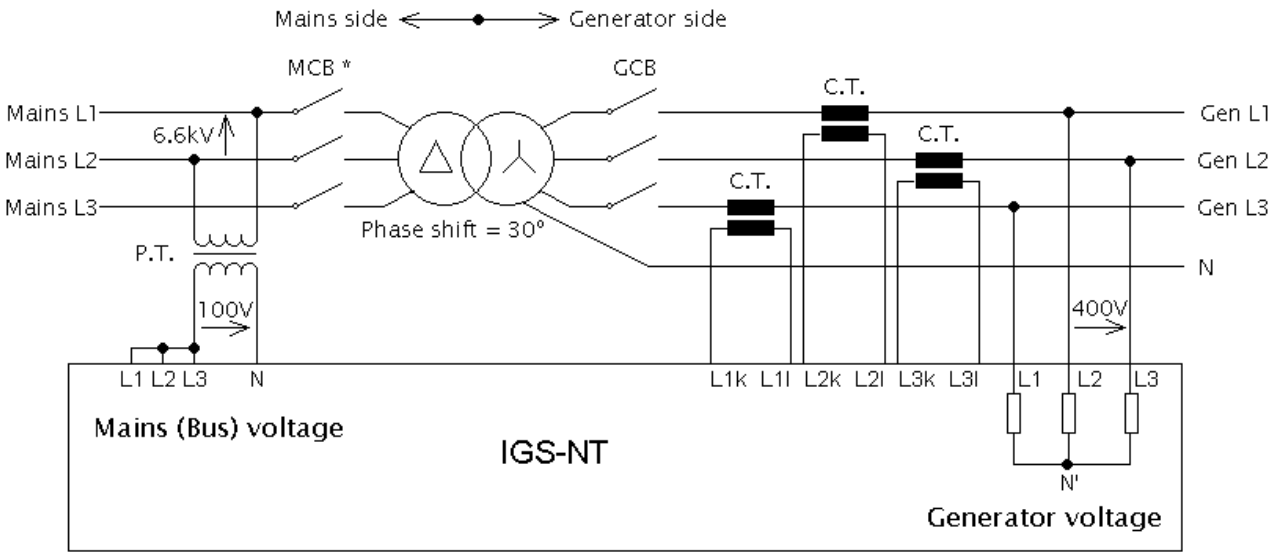
GenNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	231	V
GenNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	400	V
MainsNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	6600	V
MainsNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	11431	V

Vm VT ratio setpoint should be set to 66, if P.T. transformer with nominal high voltage 6600V and nominal low voltage 100V is used.
Another setting has to be done in the group of setpoints Sync/Load ctrl:
GToM AngleReq = 30°

See also General Recommendation chapter!

b) One P.T. transformer, transformer phase shift 30º

Transformer with phase shift 30º is connected between the mains side and the generator side, P.T. transformer is connected between phase L1 and L2. Connect controller terminals according to the next picture:



Controller terminals connection II

* This picture is related to the SPtM application, there is no MCB in case of the MINT or the SPI application.

Recommended setpoints setting

It is necessary to set the mains nominal Ph-Ph voltage to 11 431V, because the real Ph-Ph voltage is connected between the phase inputs L1, L2, L3 and neutral conductor N (see the picture Controller terminals connection II):

$$MainsNomVph-ph = \sqrt{3} \cdot MainsNomV = \sqrt{3} \cdot 6600 = 11431\,\mathrm{V}$$

Recommended setting of setpoints of the Basic settings group:

GenNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	231	V
GenNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	400	V
MainsNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	6600	V
MainsNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	11431	V

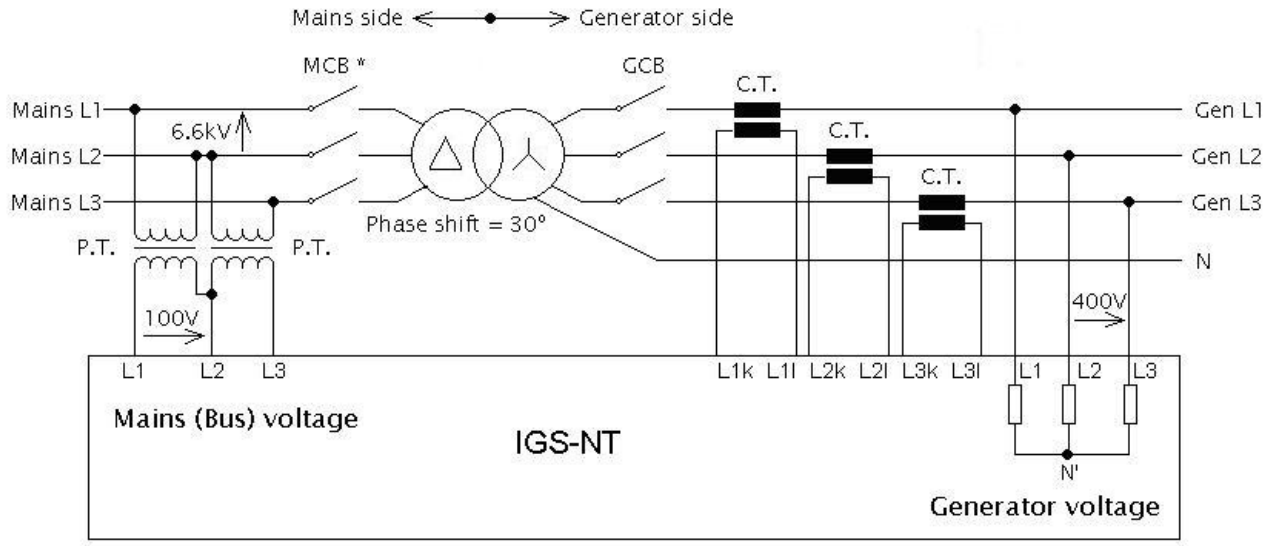
Vm VT ratio setpoint should be set to 66, if P.T. transformer with nominal high voltage 6600V and nominal low voltage 100V is used.

Another setting has to be done in the group of setpoints Sync/Load ctrl:
GToM AngleReq = 0°

See also General Recommendation chapter!

c) Two P.T. transformers, transformer phase shift 30º

Transformer with phase shift 30º is connected between the mains side and the generator side, two P.T. transformers are connected according to the next picture:



Controller terminals connection III

* This picture is related to the SPtM application, there is no MCB in case of the MINT or the SPI application.

Recommended setpoints setting

Standard voltage setting should be used in this case:

$$MainsNomV = \frac{MainsNomVph-ph}{\sqrt{3}} = \frac{6600}{\sqrt{3}} = 3811\,\mathrm{V}$$

Recommended setting of setpoints of the Basic settings group:

GenNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	231	V
GenNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	400	V
MainsNomV	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	3811	V
MainsNomVph-ph	0 ON 1 OFF 2 OFF 3 OFF 4 OFF 5 OFF 6 OFF 7 OFF	6600	V

Vm VT ratio setpoint should be set to 66, if P.T. transformer with nominal high voltage 6600V and nominal low voltage 100V is used.

Another setting has to be done in the group of setpoints Sync/Load ctrl:
GToM AngleReq = 30°

See also General Recommendation chapter!

General Recommendation

Please be aware of possible out of sync CB closing if GToM AngleReq is set in a wrong way!
The best way how to check its correct setting and measurement connection in general is to close the respective CB to the dead bus. Normally the easiest way should be to disconnect the mains (bus) disconnecter and close GCB (and MCB in case of SPtM application) to get voltage from one source (running generator) to both Generator and Mains (Bus) measuring terminals.

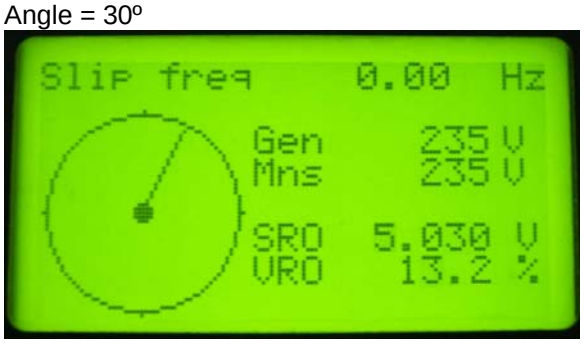
Please make sure that the following conditions are met to avoid out of sync CB closing:

1. Angle value shown on synchroscope (in InteliMonitor go to Monitor/Values/Gener Values and check the value Angle) must be equal to the GToM AngleReq setpoint.

Typical possibilities are:

Angle = 0º

Angle = 30º



2. Alarm list must not contain neither the message *G ph opposed* nor *M ph opposed* as these messages indicates reverse phase rotation.

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