Dynamic Rating, Monitoring, Control and Communications

DRMCC-T2

VARIABLES FOR SETUP & CONTROL

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REVISION HISTORY

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TAP CHANGER

NECESSARY DIGITAL INPUTS:

- Tap change remote (From local/remote switch)
- Tap change in progress
- Tap change motor trip
- Auxiliary power failure *

OPTIONAL DIGITAL INPUTS:

- 5 inputs for digital tap position indicator *
- Tap changer pressure surge
- Tap changer oil low

OPTIONAL DIGITAL OUTPUTS:

- Tap raise signal
- Tap lower signal

NECESSARY ANALOG INPUTS:

- 0-10mA TPI transducer *
- 0-150V terminal voltage, 110VAC nom p-p, 63,5VAC nom p-n (1,2 or 3 phase as defined by DRMCC Requirements for Voltage and Cooling control)

ALARMS & INDICATION

OPTIONAL DIGITAL INPUTS:

- 4 miscellaneous alarms active high
- 3 miscellaneous alarms active low
- Buchholz surge
- Buchholz gas
- Pressure relief device
- Transformer oil low
- Hydran gas hi
- Hydran gas hi-hi
- Hydran fail

OPTIONAL DIGITAL OUTPUTS:

- Temperature
- Cooling fail
- Voltage
- TC fail
- Ancillaries
- DRMCC (From UIM)
- 7 miscellaneous alarms

OPTIONAL ANALOG INPUTS:

- 4-20mA Hydran Gas
- 4-20mA Moisture

OPTIONAL ANALOG OUTPUTS:

- 4-20mA Top oil temperature
- 4-20mA Winding Hot spot temperature

COOLERS

NECESSARY DIGITAL INPUTS - FANS:

(Repeat all controls if 2 fan banks)
- Fan “in service” (From Off/Test/In service)
- Fan “test” (From Off/Test/In service)
- Fan on contactor
- Fan trip
- Auxiliary power failure *

OPTIONAL DIGITAL INPUTS - FANS:

(Repeat all controls if 2 fan banks)
- Fan VSD1 reference speed reached
- Fan VSD2 reference speed reached

OPTIONAL DIGITAL OUTPUTS - FANS:

(Repeat all controls if 2 fan banks)
- Start Fan
- Stop Fan

OPTIONAL ANALOG OUTPUTS - FANS:

- 4-20mA VSD1 reference speed
- 4-20mA VSD2 reference speed

NECESSARY DIGITAL INPUTS - PUMPS:

- Oil flow low
- Auxiliary power failure *

(Repeat all controls if 2 cycled pumps)
- Pump “in service” (From Off/Test/In service)
- Pump “test” (From Off/Test/In service)
- Pump on contactor
- Pump trip

OPTIONAL DIGITAL OUTPUTS - PUMPS:

(Repeat all controls if 2 cycled pumps)
- Start Pump
- Stop Pump

NECESSARY ANALOG INPUTS:

- 0-10mA TPI transducer *
- 4-20mA top oil temperature transducer
- 4-20mA ambient temperature transducer
- 0-10mA winding current, 5mA nom (1,2 or 3 phase as defined by DRMCC Requirements for Voltage and Cooling control)

OPTIONAL ANALOG INPUTS:

- 4-20mA cooler top oil temperature transducer
- 4-20mA cooler bottom oil temperature transducer
- 4-20mA fibre optic winding temperature transducer (up to 4)
- 0-150V terminal voltage, 110VAC nom p-p, 63,5VAC nom p-n (1,2 or 3 phase as defined by DRMCC Requirements for Voltage and Cooling control)

DRMCC REQUIREMENTS FOR VOLTAGE CONTROL AND COOLING CONTROL.

NOTE: *The tap position is required for both voltage control and cooling control (in the thermal model) and may be derived from a current loop input or digital inputs in the form of a six bit raw binary, binary coded decimal (BCD) or grey code.*

VOLTAGE CONTROL.

The DRMCC requires inputs of voltage, current, watts and VArs as measured from the transformers secondary terminal. Watts and VArs will usually come from the SICM 2 unit as a result of internal calculations from voltage and current inputs to it. See the SICM documentation for details on connection requirements. The DRMCC can block tap change control for over current conditions in the OLTC. This may require a current measurement from the primary side, if the transformer is a 3 winding type with the OLTC in the primary. In the case of an auto transformer, the over current blocking is dependent upon the actual configuration of the tapping windings.

COOLING CONTROL.

In addition to tap position and current inputs (see below) the DRMCC requires digital status inputs from the cooling hardware and provides relay outputs to control the cooling hardware. The minimum current inputs are:

1.1Transformer type: 2 wdg. separately wound

1. Measure the secondary current and calculate the primary using the tap ratio
2. Measure the primary current and calculate the secondary using the tap ratio
3. Measure the secondary V, I, P & Q. Calculate the primary current from the tap ratio. This can also be used for voltage control.

2.Transformer type: 2 wdg. auto wound

1. Measure the secondary current and calculate the primary and common using the tap ratio.

2.Measure the primary current and calculate the secondary and common using the tap ratio.
3.Measure the common winding current and calculate the primary and secondary using the tap ratio.
4.Measure the secondary V, I, P & Q. Calculate the other currents. This can also be used for voltage control.

3.Transformer type: 3 wgd. separately wound
1.Measure the primary, secondary and tertiary currents
2.Measure the secondary and primary V, I, P & Q. Calculate the tertiary quantities from circuit theory. This can also be used for voltage control
3.Measure the secondary and tertiary V, I, P & Q. Calculate the primary quantities from circuit theory. This can also be used for voltage control.

4.Transformer type: 3 wdg. auto wound
1.Measure the primary, secondary, tertiary and common currents.
2.Measure the secondary and primary V, I, P & Q. Calculate the tertiary quantities and common current from circuit theory. This can also be used for voltage control
3.Measure the secondary and tertiary V, I, P & Q. Calculate the primary quantities and common current from circuit theory. This can also be used for voltage control.