



Powering Innovation



PROTECTION + AUTOMATION + CONTROL

NUMERICAL TRANSFORMER DIFFERENTIAL RELAY JND 040

JVS ELECTRONICS PVT. LTD.

#121, Manchanayakanahalli,
Bangalore Mysore Highway, Bidadi,
Ramanagara District - 562 109, Karnataka, India
+91 94808 26272, +91 94808 26260
bangalore@jvselectronics.in, www.jvselectronics.in

FEATURES

- ◆ Biased current differential protection
- ◆ Fast differential Hi-set
- ◆ Dual slope characteristics
- ◆ Inbuilt CT Ratio correction factor
- ◆ Adjustable 2nd harmonic restraint
- ◆ Adjustable 5th harmonic blocking
- ◆ Inbuilt Vector group compensation.
- ◆ Two groups of settings
- ◆ History of 5 latest faults

Application

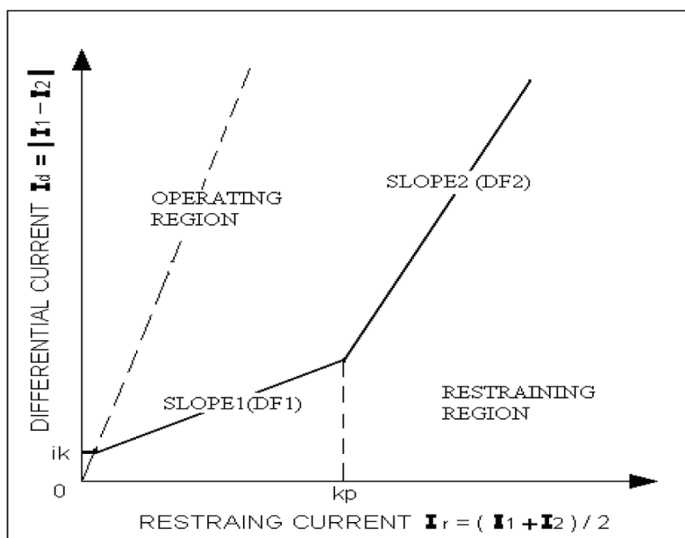
JND 040 is a two winding numerical transformer differential relay. The relay is used for protection of power transformer against hazardous internal faults.



PRINCIPLE OF OPERATION

JND 040 provides differential protection for power transformer. The Relay measures the line current of each phase from each winding of the transformer. The Relay calculates differential current (I_d) and restraining current (I_r) per phase. The differential characteristics define the operating and the restraining regions. The shape of the characteristics defined by Initial pickup (i_k), SLOPE 1 (DF1), SLOPE2 (DF2) and break point (k_p) are programmable. If ' I_r ' is less than ' k_p ', then characteristics is defined by 'DF1' and is applicable for small differential currents. If ' I_r ' is greater than or equal to ' k_p ', then characteristics is defined by 'DF2' and is applicable for large differential currents. If the operating point i.e. (I_d , I_r) is within the operating region, then relay trips. The relay provides programmable 2nd and 5th harmonic current restraint, which exists when transformer is energized and over excitation condition exists respectively. The relay provides stability on external "line to line" and "line to ground" faults. The relay has in-built vector group compensation selection and CT ratio correction, hence the usage of external interposing CT can be avoided.

DIFFERENTIAL CHARACTERISTICS.



TECHNICAL DATA

RATINGS

Primary current rating	:	0.577A / 1A / 2.89A / SA
Secondary current rating	:	0.577A / 1A / 2.89A / SA
Auxiliary Supply	:	20 to 60V DC 75 to 150V DC 175 to 300V DC / 185 to 250V AC

SETTINGS

Pickup (ik)	:	0.10 to 1.00pu in steps of 0.05pu
Slope1 (DF1)	:	10 to 100% in steps of 5%
Slope2 (DF2)	:	50 to 200% in steps of 5%
Breakpoint (kp)	:	1.0 to 10.0pu in steps of 0.1pu
Differential Hiset	:	2 to 20pu in steps of 1pu
CT Ratio W1	:	0.5 to 2.00pu in steps of 0.0 1pu
CT Ratio W2	:	10 to 50% in steps of 5%
Inrush (2f)	:	10 to 100% in steps of 5%
Over excitation(5f)	:	Yy0, Dd0, Yd1 , Dy1 , Dd2, Dd4,
Vector Groups	:	Yd5, Dy5, Yy6, Dd6, Yd7, Dy7, Dd8, Dd10, Yd11 , Dy11.

OVER LOAD RATINGS

Current input	:	2 times Rated continuous 20 times Rated for 3s 40 times Rated for 1s
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BURDEN

Current input	:	0.1VAper phase (Rated 5A) 0.05VA per phase (Rated IA)
Aux. Supply	:	Less than 6W (non operated) Less than 11W (operated)

OPERATING TIME

Operating time	:	Typical 35ms
High st operating time	:	Typical 30ms

ACCURACY

Operating value	:	±5%
Operating time	:	+7ms

CONTACT RATINGS

Make & carry	:	1250VA with max. current 5A or max. Voltage 660VAC 1000W with max. current 5A or max. Voltage 250VDC
Break	:	2500 VA with max current 10A or max. Voltage 660VAC 200 W (resistive) 100 W (inductive) with max. current 10A or max. Voltage 250V DC

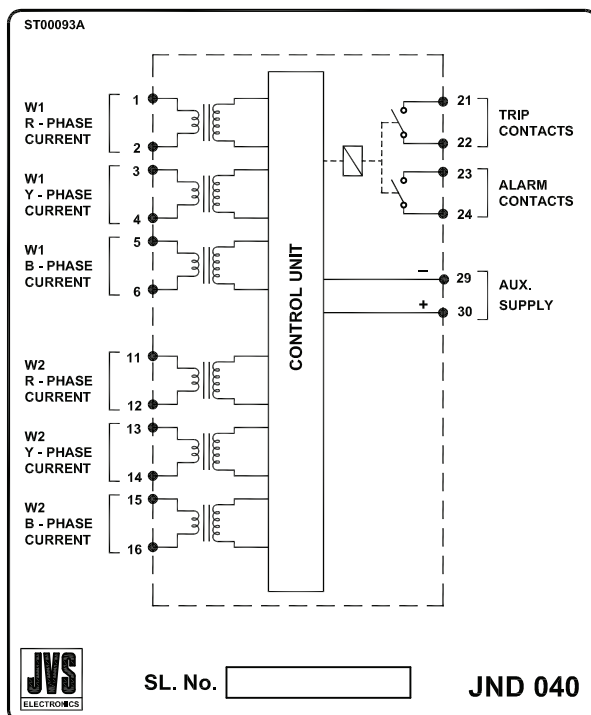
CONTACTS DURABILITY

Loaded contact : 10,000 operations minimum
 Unloaded contact : 100,000 operations minimum

MECHANICAL DESIGN

Weight : App. 5 Kgs.
 Case Size : Fascia 152 x 296 mm, Depth 250mm
 Installation : Flush mounting
 Panel cutout : 146 x 264 mm

TERMINAL DIAGRAM



ORDERING INFORMATION

Primary current rating : 0.577A / 1A / 2.89A / 5A
 Secondary current rating : 0.577A / 1A / 2.89A / 5A
 Aux. Supply : 20-60VDC
 75 - 150V AC /DC
 175 - 300V DC or
 185-250V AC