Trafoswitching Relay | Type TSRDF

intelligent electronics | FSM®

Note: Installation and commissioning may be performed by qualified person or unter survey of a qualified person.

The TSRDF is a control module which can be used as a controlling element in connection with external thryistors or semiconductor relays to form a fast acting transformer switching relay. Both three-phase transformers as well as combinations of three individual single-phase transformers can be switched-on in a three-phase network without inrush currents arising. The TSRDF is connected with a solid state controlling element between the mains and the transformer. The required application is selected using DIP-switches.

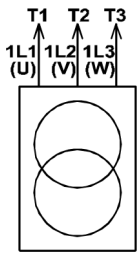
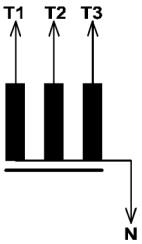
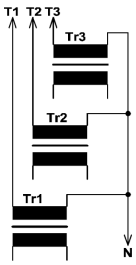
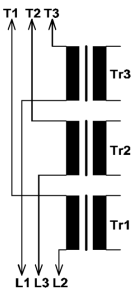
Safety Instructions

The TSRDF should be installed and connected without applied voltage only by trained electrotechnical personnel. In addition initial operation and commissioning should also be carried out only by suitably trained electrotechnical personnel. Potential separation does not occur during switching of the TSRDF as additional RC elements are connected between the input and the output thyristor clips.

General

The required application is selected using DIP-switches. In the case of applications N and L the transformer core type must be selected at TP1 (transformer type) The TSRDF has a Message Display Output (message 1). Depending on the DIP-switch selections four different conditions can be displayed. The DIP-switches should be set only when the power is off.

Applications

Application D	Application S	Application N	Application L
Three-phase transformer, primary side delta or star config. without N (neutral) (arbitrarily loading). Winding direction-important for transformer connection.	Three-phase transformer, primary side star config. with N (neutral) (arbitrarily loading). Winding direction important for transformer connection.	Three-single-phase transformers having the same core (arbitrarily loading). The core type is set atTP1.	Three-single-phase transformers having the same core (arbitrarily loading). The core type is set at TP1.
			

DIP-Switch

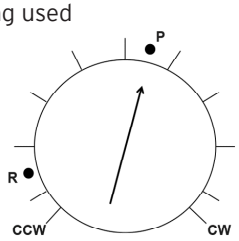
Switch	Function	Position	
1	Error handling	OFF	No automatic restart
		ON	Automatic restart after an error
2	Rotation direction recognition	OFF	Switched-on for clockwise phase-sequence
		ON	Switched-on for clockwise and anticlockwise phase-sequence
3	Control input 1 (Remote-on input)	OFF	Control input enabled for external control signal
		ON	Switched-on without external control signal
4	Control input 2	OFF	Control input enabled for additional external control signal
		ON	Switched-on without external control signal

28.01.2016

		5	6	Function message display 1:
		OFF	OFF	Fully-on message
5/6	Message 1	ON	OFF	OK-Message
		OFF	ON	Error-Message
		ON	ON	Bypass contactor control
		7	8	Application:
		OFF	OFF	D, Three-phase transformer, delta or star config. without MP
7/8	Applications	ON	OFF	S, Three-phase transformer, star configuration with MP
		OFF	ON	N, 3 Single phase transformer between phase and N
		ON	ON	L, 3 Single phase transformer between two phases

Setting the premagnetisation on the trimming potentiometer depending on transformer type:

On the trimmer potentiometer TP1 the transformer core type of the single-phase transformer being used for application N or L must be set. For applications D and S the trimmer function does not apply.



- Toroidal core transformers: Set to position R
- Coil form transformers: Set to position P (factory setting)
  The correct position for stack-core transformers (P) can vary between the „10- and 2 o'clock „ position.
- Strip-wound cut core transformers: Potentiometer setting between the „P" and „R" settings

Messages

The LED „Message Display 1" (yellow) is illuminated, when the relay contact between the terminals 23 and 24 is closed. The Message Display1 can be applied for various functions:

- Fully-on-Message: The relay contact is closed, as soon as the connected transformer has been fully switched-on by the TSRDF when the premagnetisation (remnance setting) is completed.
- OK-Message: The relay contact is closed after power is supplied to the TSRDF and initialisation is complete . On malfunction the contact is opened.
- Error-Message: On malfunction the contact is closed
- Without Message: The contact is not activated, or the relay contact is controlled by the customer specific function.
- Bypass-Contactor-Control: The relay contact is used to control a bypass contactor, used to bridge the control elements.

OK-LED

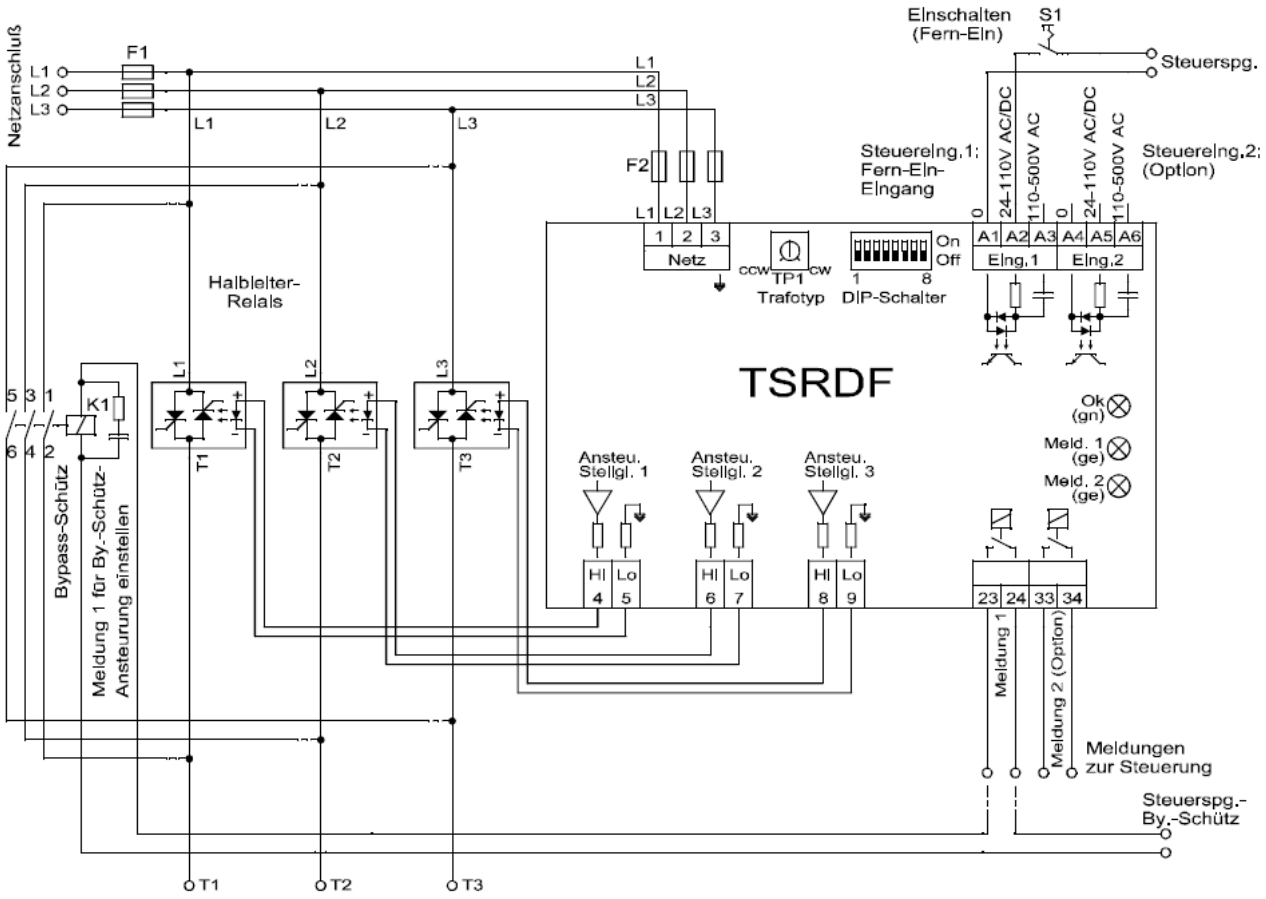
The LED OK (green) is illuminated when the TSRDF is in the 'OK' status. Malfunctions are indicated by different flashing rates.

Flashingrate	Malfunction
Continious	OK-state
10 Hz	A remote-on signal has been applied, and no automatic resetting after malfunction (DIP1=Off)
5 Hz	Three-phase network is counter-clockwise, and switching-on only for clockwise phasesequence (DIP2=Off)
1 Hz	The supply voltage is outside the limiting voltage values (-20/+15% of U_{rated})
10 Hz	Internal error

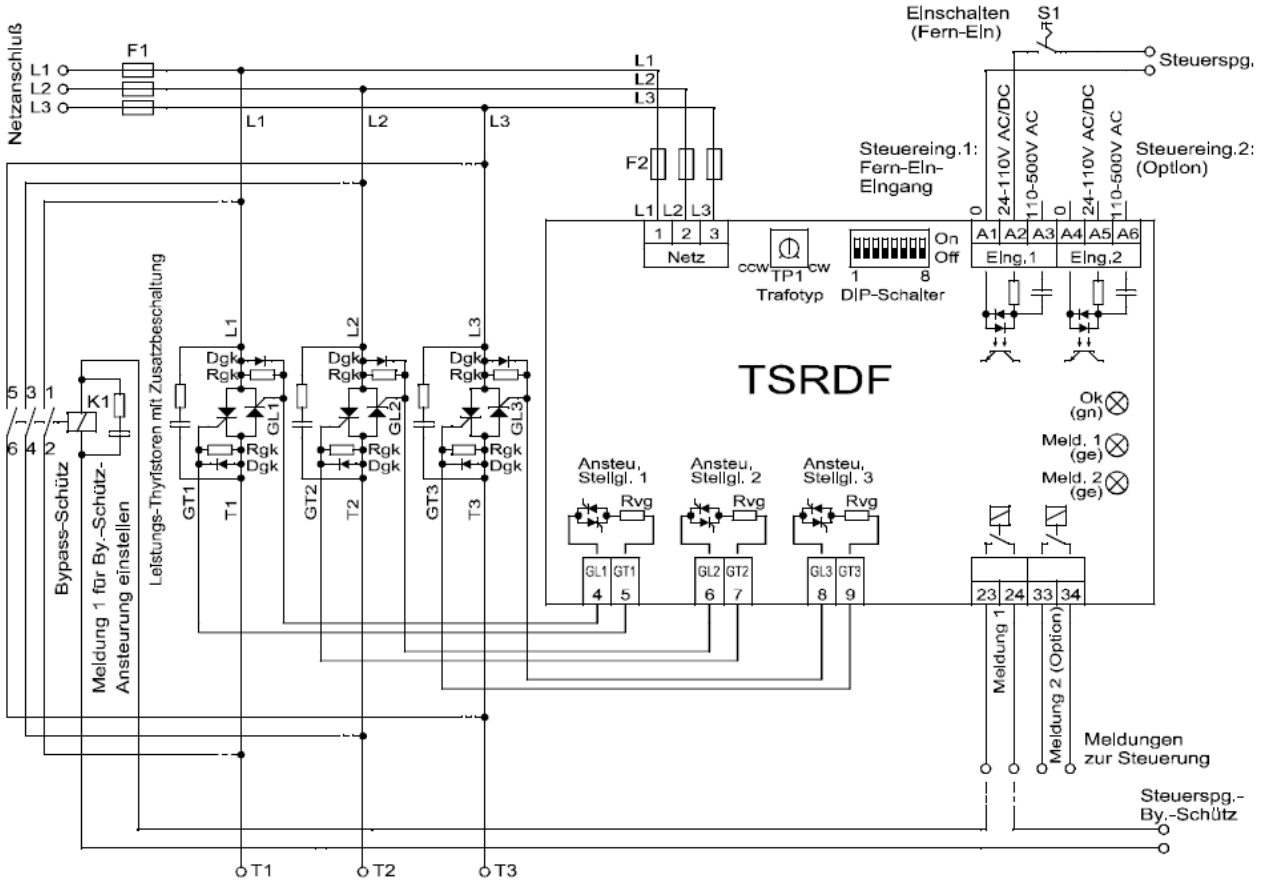
Other

- To protect the safety coil it is recommended to connect an RC-element parallel to the coil.

TSRDF connection diagram for external thyristors



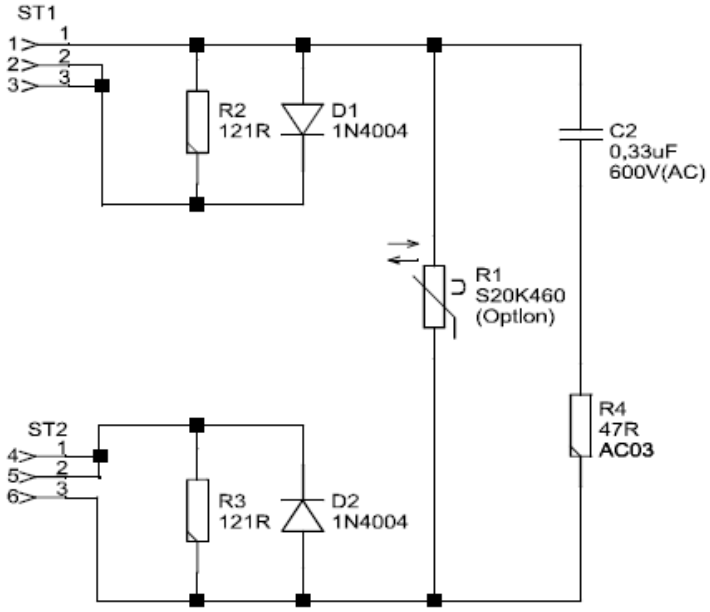
TSRDF connection diagram for external semiconductor relays



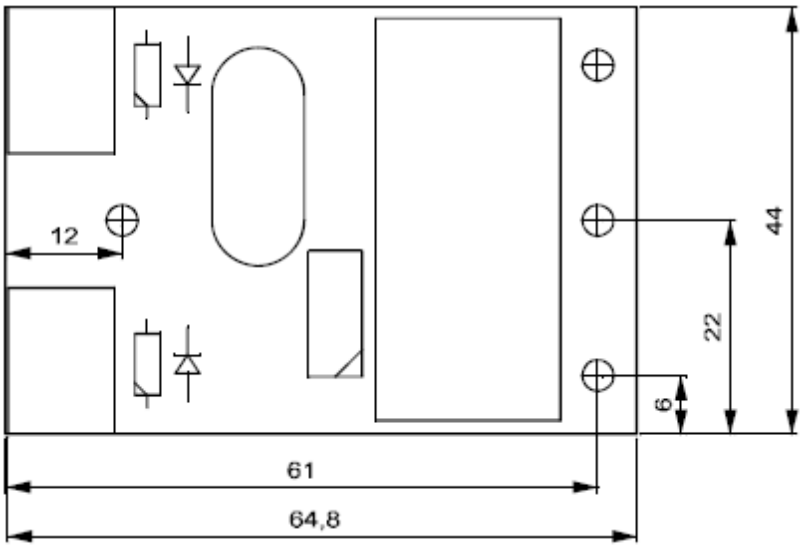
RCP Board for Thyristors

The RC-element and die Gate-cathode-wiring for a thyristor module or two antiparallel connected thyristors are present on the RCP-printed circuit board as control elements. Thus a thyristor module or two antiparallel connected thyristors either TSRLF or TSRDF can be controlled. Spring reversal clips are used on the RCP printed circuit board (clamping area 0.1–2mm²).

› Circuit Layout:



› Dimensions:



› Wiring diagram: