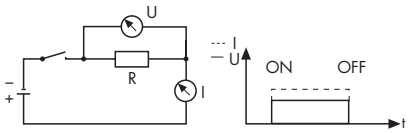
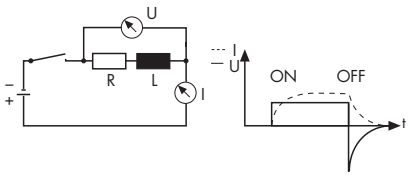
	99.01		99.02		99.80	
						
	Sockets	Relays	Sockets	Relays	Sockets	Relays
	90.20	60.12	94.02	55.32	94.84.1	55.32, 55.34
	90.21	60.13	94.03	55.33		
	94.73	55.33	94.04	55.32/34		
	94.74	55.34	95.03	40.31 - 41.31		
	94.82	55.32	95.05	40.51/52/61		
	95.63	40.31		41.52, 41.61		
	95.75	40.51/52/61 - 41.52/61		44.52, 44.62		
		44.52/62	92.03	62.32, 62.33		
	96.72	56.32				
	96.74	56.34				
FUNCTION/ OPERATING RANGE	**CODE**		**CODE**		**CODE**	
GREEN LED + DIODE MODULE (STANDARD POLARITY)						
6 - 24 V DC 28 - 60 V DC 110 - 220 V DC	99.01.9.024.99 99.01.9.060.99 99.01.9.220.99		99.02.9.024.99 99.02.9.060.99 99.02.9.220.99		99.80.9.024.99 99.80.9.060.99 99.80.9.220.99	
GREEN LED + DIODE MODULE (INVERTED POLARITY)						
6 - 24 V DC 28 - 60 V DC 110 - 220 V DC	99.01.9.024.79 99.01.9.060.79 99.01.9.220.79		99.02.9.024.79 99.02.9.060.79 99.02.9.220.79			
GREEN LED + VARISTOR						
6 - 24 V AC/DC 28 - 60 V AC/DC 110 - 240 V AC/DC	99.01.0.024.98 99.01.0.060.98 99.01.0.230.98		99.02.0.024.98 99.02.0.060.98 99.02.0.230.98		99.80.0.024.98 99.80.0.060.98 99.80.0.230.98	
GREEN LED						
6 - 24 V AC/DC 28 - 60 V AC/DC 110 - 240 V AC/DC	99.01.0.024.59 99.01.0.060.59 99.01.0.230.59		99.02.0.024.59 99.02.0.060.59 99.02.0.230.59		99.80.0.024.59 99.80.0.060.59 99.80.0.230.59	
DIODE MODULE (STANDARD POLARITY)						
6 - 220 V DC	99.01.3.000.00		99.02.3.000.00		99.80.3.000.00	
DIODE MODULE (INVERTED POLARITY)						
6 - 220 V DC	99.01.2.000.00		99.02.2.000.00			
RC MODULE						
6 - 24 V AC/DC 28 - 60 V AC/DC 110 - 240 V AC/DC	99.01.0.024.09 99.01.0.060.09 99.01.0.230.09		99.02.0.024.09 99.02.0.060.09 99.02.0.230.09		99.80.0.024.09 99.80.0.060.09 99.80.0.230.09	
NO - REMANENCE						
110 - 240 V AC	99.01.8.230.07		99.02.8.230.07		99.80.8.230.07	

Voltage-current characteristic when switching an ohmic load (illus. 1).



Voltage-current characteristic when switching a relay coil (illus. 2).



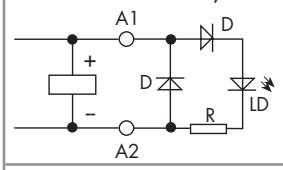
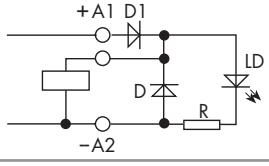
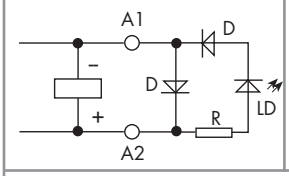
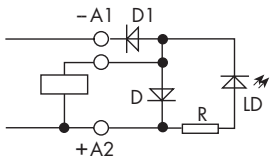
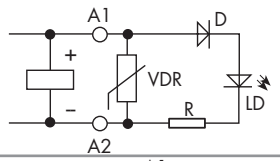
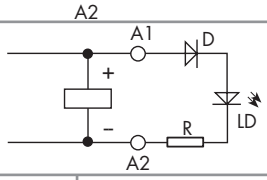
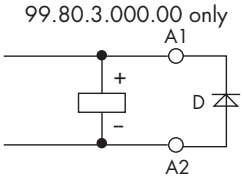
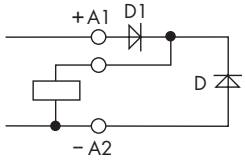
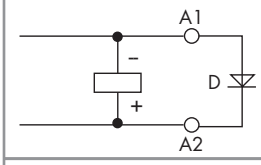
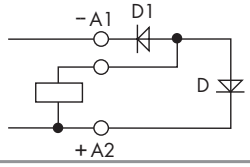
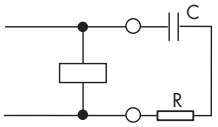
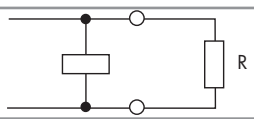
Switching Relay Coils.

When switching an ohmic resistor current follows voltage directly (illus.1).

When switching relay coils a typical voltage-current characteristic, which is divergent to one of an ohmic resistor, can be seen in (illus. 2).

First a magnetic field must be built up when energizing a relay coil (represented as inductance L and resistor R in illus.2). Due to counter-electromotive forces current follows voltage delayed. When de-energizing the coil, the current flow is interrupted and the magnetic field collapses which induces a voltage that counteracts with the supply voltage. Negative cut-off voltage peaks can reach values approximately 15 times higher than the supply voltage. These peaks can either disturb or destroy electronic devices. To counteract against this effect relay coils should be suppressed with a Diode, a Varistor or a RC Module depending on the operating voltage (see funtional description of Modules below).

(The above description is based on a DC coil. The above description is also valid for AC coils. When switching AC relay coils the current at make is approximately 1.3 to 1.7 times the nominal current depending on coil size.)

Diagrams	Functions
99.01.9.xxx.99 only 99.80.9.xxx.99 only  99.02.9.xxx.99 only  	**GREEN LED +DIODE MODULE (STANDARD POLARITY)** Recovery diode modules + LED are used for DC only. The negative cut-off voltage peaks of the coil are short circuited by the recovery diode (positive to terminal A1). The drop-out time increases by an approximate factor of 3. If an increase of the drop-out time is not wanted use a Varistor or RC module. The LED indicator lights up when the coil is energized.
99.01.9.xxx.79 only  99.02.9.xxx.79 only  	**GREEN LED +DIODE MODULE (INVERTED POLARITY)** Recovery diode modules + LED are used for DC only. The negative cut-off voltage peaks of the coil are short circuited by the recovery diode (positive to terminal A2). The drop-out time increases by an approximate factor of 3. If an increase of the drop-out time is not wanted use a Varistor or RC module. The LED indicator lights up when the coil is energized.
 	**GREEN LED + VARISTOR** LED modules + Varistor are used for both AC and DC coils. The cut-off voltage peaks of the relay coil are limited by the Varistor to approximately 2.5 times the nominal voltage of the module. When using DC coils it is essential that positive is connected to terminal A1. The relay drop-out time increases only insignificantly.
 	**GREEN LED** LED modules are used for AC and DC. The LED indicator lights up when the coil is energized. When using DC it is essential that positive is connected to terminal A1.
99.01.3.000.00 only 99.80.3.000.00 only  99.02.3.000.00 only  	**DIODE MODULE (STANDARD POLARITY)** Recovery diode modules are used for DC only. The negative cut-off voltage peaks of the coil are short circuited by the recovery diode (positive to terminal A1). The drop-out time increases by an approximate factor of 3. If an increase of the drop-out time is not wanted use a Varistor or RC module.
99.01.2.000.00 only  99.02.2.000.00 only  	**DIODE MODULE (INVERTED POLARITY)** Recovery diode modules are used for DC only. The negative cut-off voltage peaks of the coil are short circuited by the recovery diode (positive to terminal A2). The drop-out time increases by an approximate factor of 3. If an increase of the drop-out time is not wanted use a Varistor or RC module.
 	**RC MODULE** RC circuit modules are used for AC and DC coils. The cut-off voltage peaks of the relay are limited by the RC module to approximately 2.5 times the nominal voltage of the modules. The relay drop-out time increases only insignificantly.
 	**NO - REMANENCE** Bypass modules are advisable, if the relay coils do not drop-out between 110 - 240 V AC. Failure to drop-out can be caused by residual currents from AC proximity switches or inductance couplings caused through long parallel lying AC control lines.