



# TF20 Wetting Module



## **Introduction**

The TF20 Wetting Module is designed to provide a nominal 24 Volt DC / 1 Amp contact load to assist the cleaning of contaminated electro-mechanical relay contacts fitted with contacts with a minimum rating of 24 V/1A switching capability. The module interfaces with the relay to be cleaned via a 60 pin Hirose socket mounted at the front of the unit.

The action of operating and releasing relay contacts whilst applying a wetting is primarily designed to assist the removal of contact contamination such as oxidation or any other contamination, a secondary effect may be to open welded contacts. Several operations of the TF20 test sequence may be required to rectify the contact faults. However relay contacts which are severely contaminated or welded might never recover and these should be discarded.

## **Relay compatibility**

The unit is designed to be used with single coil mono-stable or dual coil bi-stable relays which can operate from a DC coil voltage not exceeding 250 Volts and have a maximum coil current not exceeding 0.5 Amps. Flashing and timing relay types should not be used.

The unit is NOT suitable for use with relays which are fitted with one or more gold plated or low power relay contacts. If used with this type of relay contact the contact plating will be rapidly damaged.

## **Use with the TF10/TF15**

The Hirose 60 pin connector is compatible with Applied Relay Testing's TF10/TF15 series test fixtures\*. When connected, the 'Test' and 'Retest' switches will illuminate and pressing either the 'Test' or 'Retest' switch will initiate a wetting sequence. Alternatively pressing the local TF20 'Start' switch will initiate a wetting sequence.

\* These fixtures are custom designed for specific relay footprints – please contact ART if alternate footprints are required.

## **Coil power selection**

By default the rear panel slide switch should be set to '24V'. In this position the unit will operate single coil mono-stable or dual coil latching relays requiring a nominal 24 Volt dc coil voltage.

To use the unit with relays with other DC coil voltages the rear panel slide switch should be set to 'EXT'. In this mode coil power can be provided from an external bench style power supply (not provided) connected to the rear

panel red (+ve) and black (-ve) 4mm terminals. Internal protection will disable the coil power should the polarity of the external power supply be reversed.

Relays which require an AC only coil drive are not suitable for use with this unit.

### **Contact status LEDs**

During the wetting sequence, the top panel indicates the status of the relay contacts an up to 4 change over contacts. An LED illuminates when the associated device contact is closed. At the end of the contact wetting sequence the LEDs will all extinguish regardless of the relay contact state.

### **Powering up the TF20**

The unit is powered from an external mains operated 24V dc power supply. The inlet to this power supply uses a figure of 8 power lead (supplied) which should be connected to a mains socket using a plug fitted with a 3A fuse. The outlet power connector of this supply should be connected to the TF20 rear panel 2.1mm power inlet (centre positive).

The power supply provides the power to the contact loads, system control circuitry and optionally the device coil(s). Internal protection will disable the power supply should the polarity of the external power supply be reversed. If the power supply is replaced then a substitute 24V/5A DC supply may be used.

The TF20 power can then be enabled using the rear top panel 'Power' rocker switch, the accompanying green power LED will illuminate and the internal cooling fan will operate.

Caution: To avoid damage to the unit or PSU do not obstruct the vents whilst power is applied.

### **Test sequence**

Momentarily press the 'Start' or TF10/15 'Test' or 'Retest' switch to commence the wetting sequence. Any further presses of one or more of these switches will be ignored until the sequence finishes at which time the status of the switches will once again be monitored.

The unit applies the wetting load to the closed contacts of the relay under test.

A burst of 20 coil operating pulses will be applied alternatively to the SET and RESET coil (if fitted) in such a way that either single coil mono-stable or dual coil latching relays can be cycled automatically.

The top panel yellow LEDs monitor up to four Normally Open (NO) and four Normally Closed (NC) contacts. During the test sequence contact status LEDs will indicate if contact load current is flowing in the relay under test.

An LED which is permanently enabled indicates:

- a contact weld
- damaged relay coil
- insufficient coil voltage
- relay coil cannot be operated from a DC coil power supply.

An LED which is permanently disabled indicates:

- the contact is still contaminated
- the device under test does not have a contact in that position
- damaged relay coil
- insufficient coil voltage
- relay coil cannot be operated from a DC coil power supply.

If required the wetting process can be repeated as required to see if the relay contact begins to operate correctly.

After 20 device cycles the unit will remove power from the device coils and contact loads. The fan continues to operate until the power switch is turned off to allow any internal heat built up in the contact load resistors to be dissipated. Whilst the wetting load is being applied the fan in the external power supply may also operate.

## Connector pin assignments

### Power inlet

Pin	Description
Centre	+24V
Outer	0V

### External coil interface

Pin	Description
Red	0-250Vdc
Black	0V

## Specifications

RUT = Relay Under Test

*TF20:*

Dimensions		215 x 143 x 70 mm
Weight		2kg
Operating Temperature		5 to 40 °C
Colour	Base Top	BS4800 00A05 powder coated BS4800 00A01 powder coated
Coil select switch	24V EXT	24Vdc to RUT coil(s) External DC supply to RUT coil(s)
External coil input	Connectors  Voltage Current	4mm terminals, red +ve, black -ve 250Vdc max 0.5A max
Wetting	Voltage Current Cycles Rate Duty cycle	24Vdc +/-10% 1A dc +/-10% 20 +/- 1 1Hz 50%/50% bi-stable relays 45%/55% mono-stable relays
RUT specification	Contacts Coil type  Coil voltage Coil current	Max 4PCO Single coil mono-stable or Dual coil latching 250V dc max 0-0.5A dc

*External Power supply:*

Dimensions	170 x 60 x 35 mm
Weight	0.5kg
Output	24V dc, 5A
Output connector	2.1mm, Centre positive
Input connector	Figure 8

Note: In the interest of continuous product improvement, ART may change these specifications without prior notice.