ACDC EXPRESS

EVERYTHING ELECTRICAL

CATALOGUE

2025/26

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ACDC Dynamics: Powering Innovation and Sustainability - At ACDC Dynamics, we don't just deliver electrical solutions—we empower you with innovative, reliable, and sustainable technologies that shape the future. With decades of experience, we have evolved into a trailblazer in the electrical field, offering world-class products and services that drive efficiency across diverse sectors.

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As we continue to expand our global reach with five regional branches, over 40 ACDC Express franchises, and more than 70 partners, ACDC Dynamics remains focused on the future—providing the solutions that will power progress in the decades to come. With us, you get more than products—you gain a partner in innovation.

Powering the world, powering your future.

ACDC DYNAMICS

THINK ELECTRICAL

Mario Maio
CEO

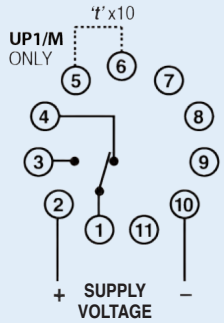
AUTOMATION

1

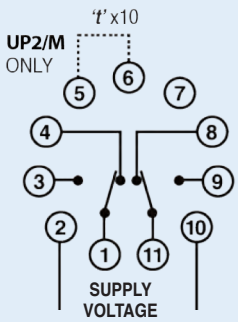
Welcome to our advanced Automation product catalogue, where innovation meets efficiency to set new industry standards. Discover precision robotics, advanced control systems, and more, designed to streamline operations and boost productivity across sectors.

TIMERS

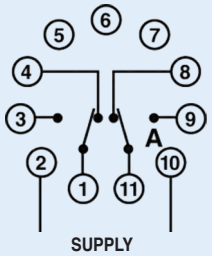
Type	Unequal Repeating & Two-Shot Timer		Delay On				Interval			Equal Repeating		Delay Off No Power		
Code	UP1/M UP1/MV	UP2/M UP2/MV	DP1*	DP2*	DP3*	DP4*	IP1*	IP2*	IP3	EP1*	EP2*	DDP1	DDP2	DDP3
Outputs	SPDT	DPDT	SPDT	DPDT	SPDT +INST	3 x c/o	SPDT	DPDT	SPDT +INST	SPDT	DPDT	SPDT	DPDT	SPDT +INST
Mode of Operation	Multi range timer **Time Ranges:** 0.15s to 10s 1s to 60s 1.5s to 100s 10s to 10m 1m to 60m 10m to 10hr Selectable by DIP switches 1, 2, 3 & 4 at rear of timer. Timing functions: Unequal repeating (off first) Unequal repeating (on first) Two-shot (off first) Two-shot (on first) Selectable by DIP switches 5 & 6 at rear of timer. **UP1/MV & UP2/MV:** Multivolt range 24-250VAC/DC		Upon application of the supply voltage the delay time period begins and the power LED lights up. On the expiry of the set time the relay LED will light up and the relay will operate and will not release until the supply voltage is disconnected. **DP3:** Output relay A is instantaneous.				Upon application of the supply voltage the relay operates, the power and relay LED lights up and the time period begins. On the expiry of the set time, the relay releases and will not operate again, until the supply is re-applied. **IP3:** Output relay A is instantaneous.			Upon application of the supply voltage the relay operates and the ON time period starts. After the ON period has expired the relay releases and an equal OFF time period starts. This equal operation continues until the supply voltage is disconnected.		No power required delay off function. Upon application of the supply voltage the relay operates. When the supply voltage is disconnected the time period starts and at the end of the time period the relay releases, the time is reset and the relay remains released until the supply voltage is reapplied. For time ranges above 600 sec there is a built-in battery. ***This timer is not to be used for short pulses, as battery requires 24H to recharge. Use IAP1or 2.***		
Connection Diagram Note: Standard stock is 11 Pin. 8 Pin available on order														



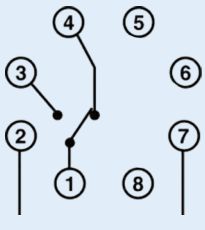
11 Pin SPDT



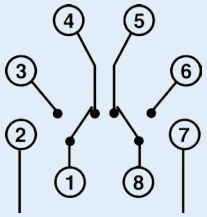
11 Pin DPDT



11 Pin SPDT+INST
A=Instantaneous Contact



8 Pin SPDT



8 Pin DPDT

Supply AC Multi-Volt Supply DC	Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Test volts 2kV) 24 - 250VAC/DC (available only on models marked *) 12, 24, 48VDC

Specification					
Range accuracy:	±5%		Power consumption	AC:	1.5VA
Repeatability:	1%			DC:	100mA @ 12VDC
Scale accuracy:	±5%		Contact rating	SPDT:	10A 250VAC
Reset time:	300mSec			DPDT:	5A 250VAC
Operating temperature:	-20 to 70°C		For external potentiometer: use 1MΩ		

See Page 1.6 for Time Ranges

TIMERS

Multi-Range Multi-Function

MFMR | **MFMRV**

DPDT

Time Ranges:
0.02 to 1s; 0.15 to 10s
1s to 60s; 10s to 600s
1m to 60m; 10m to 10h
22m to 24h; 3h45m to 240h

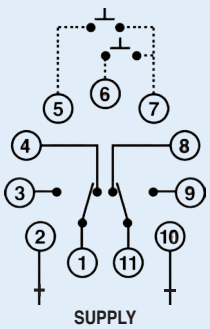
Selectable by DIP switches 1, 2 & 3 at rear of timer.

Functions:
Delay on (**DP2**)
Delay on pulse start (**DAP2**)
Interval timer (**IP2**)
Interval timer pulse start (**IAP2**)
Equal repeating timer (**EP2**) OFF first
Equal repeating timer (**EP2**) ON first

Selectable by DIP switches 4 & 5 at rear of timer.

MFMRV: Multivolt supply 24-250VAC/DC

External POT 100K



Dual Timers

DP/DP | **DP/DP/S/R** | **DP/IP**

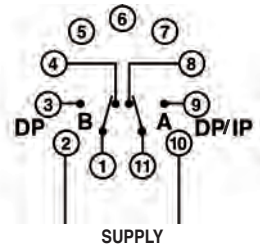
2 x SPDT

OUTSTANDING VALUE, TWO TIMERS IN ONE!

DP/DP
Two delay on timers sharing common power supply. Independently adjustable.

DP/IP
One delay on timer and interval timer sharing common power supply. Independently adjustable.

DP/DP/S/R
Dual Delay on Timers
1st Timer 60s
2nd Timer 10s



Forward Reverse Timer (Multi-Range)

WM1/M

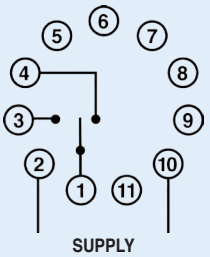
SPDT

Function: When the power is applied the contact between 1 & 4 closes. The contact remains closed for an adjustable forward or ON time period. It then opens for an adjustable pause or OFF time period. After the pause delay, contacts 1 & 3 close and remain closed for a reverse or ON time (same as the forward time). After the reverse period the contact between 1 & 3 opens for the pause time. This cycle is repeated until supply is removed.

DIP Switches 1 to 5: On Pause & Time Ranges:

0.15s to 10s	1.5s to 100s
1s to 1m	10s to 10m
10s to 10m	100s to 100m
1m to 1h	10m to 10h

DIP switch 6: OFF. Pause period first. ON: on period first. External POT 100K

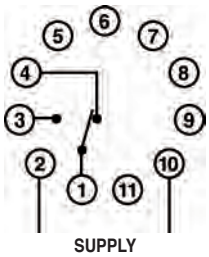


Percentage Timer

PP1

SPDT

Upon application of the supply voltage the OFF time starts. At the end of the OFF time the relay operates and stays in operation for the remaining on time. Thereafter it returns to the OFF position. ie. The total OFF and ON period is equal to the full time. This recycling operation will continue until the supply voltage is removed.



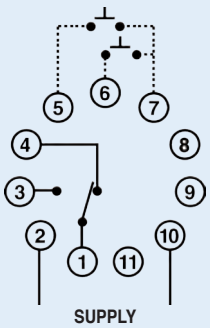
Delay on Pulse Start

DAP1 | **DAP2**

SPDT | DPDT

Start switch between 5 & 7: Apply supply voltage. Upon the closure of switch 5 & 7 the timing period starts, irrespective of whether the start switch is closed or not. After the set time the relay will operate. To repeat this function supply voltage must be removed and re-applied again.

Start switch between 6 & 7: Apply supply voltage. Upon closure of switch 6 & 7 nothing happens. The timing period will only start when the switch between 6 & 7 has opened, upon opening the timing period begins. After the set time the relay will operate.



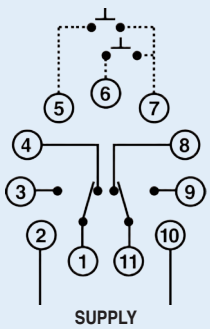
Interval Pulse Start

IAP1* | **IAP2***

SPDT | DPDT

Start switch between 5 & 7: Apply supply voltage. Upon the closure of switch between 5 & 7 the relay operates and the time period starts. When the set time has expired the relay releases irrespective of whether the start switch is still closed or not.

Start switch between 6 & 7: Apply supply voltage. Upon closure of start switch between 6 & 7 the relay operates. The time period ONLY STARTS from the break of the switch.



Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Test volts 2kV)
Multivolt 24-250VAC/DC (available only on models marked*).
12, 24, 48VDC

Specification					
	Range accuracy:	±5%	Power consumption	AC:	1.5VA
	Repeatability:	1%		DC:	100mA @ 12VDC
	Scale accuracy:	±5%	Contact rating	SPDT:	10A 250VAC
	Reset time:	300mSec		DPDT:	5A 250VAC
	Operating temperature:	-20 to 70°C	For external potentiometer: use 1MΩ		

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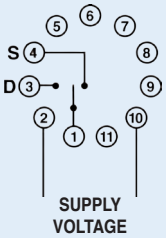
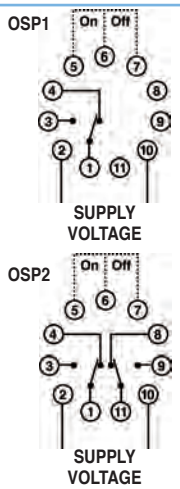
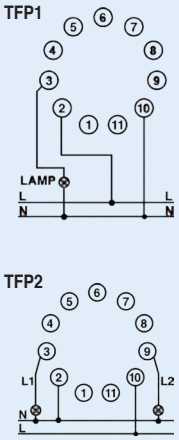
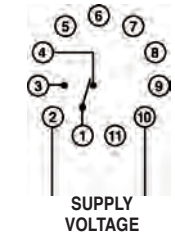
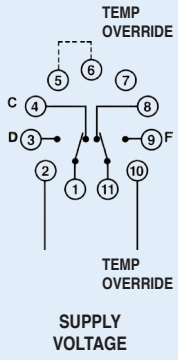
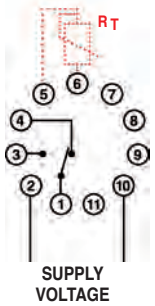
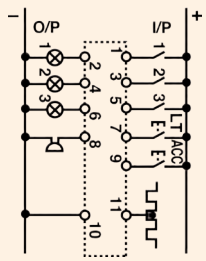
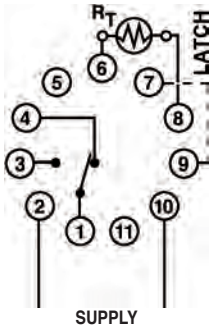
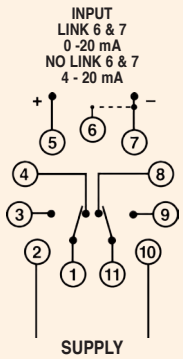
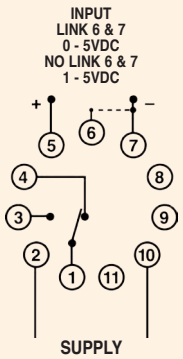
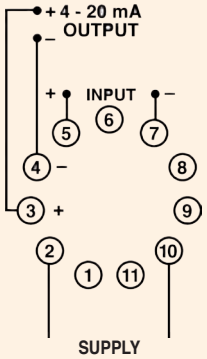
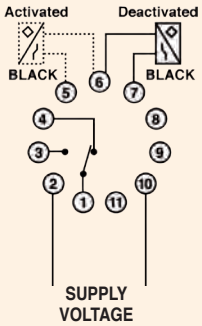
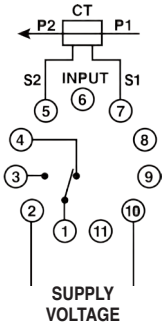
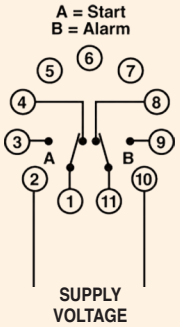
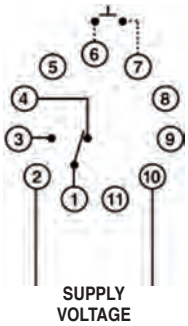
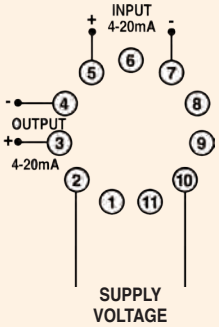
See Page 1.6 for Time Ranges

TIMERS

Type	Star-Delta Timer	One-shot Timer			Triac Flasher		Relay Flasher			Defrost Timer		Repeating Pulse	
Code	SDP1	OSP1	OSP1/S	OSP2	TFP1	TFP2	RFP1	RFP1/A	RFP2	DET1	DET1/F	RP1	RP1/R/PS
Outputs	SPDT	SPDT		DPDT	Triac Output		SPDT		DPDT	WITHOUT FAN DELAY	WITH FAN DELAY	SPDT	
Operation Mode	When supply voltage is applied connection between Pin 1 & Pin 4 is made. The time period starts for Star connection. After the Star set time has elapsed connection between Pin 1 & 4 is opened and stays in a neutral position for 100mS. After the 100mS pause connection is made between pin 1 & 3 for the Delta contactor.	LINK:5-6: Pulse on energisation LINK 6-7: Pulse on de-energisation. When the power is applied the relay operates for 0.5 sec. When power is de-energised the relay operates for 0.5 sec. **OSP1/S** High Speed Pulse Input.			**TFP1** (230VAC only) Upon applying the supply the lamp will flash with an equal on and off time until the supply is removed. This on and off time is adjustable from 0.02 - 1 sec. **TFP2** (230VAC only) Upon applying the supply, lamp 1 will switch on then switch off and then lamp 2 will switch on. This on and off time is adjustable from 0.02 - 1 sec. **Triac:** 1000W (4A) @ 250VAC		**RFP1** On applying the supply, the lamp will flash with a fixed equal on and off time of 0.5 sec. This will continue until the supply is removed. Can be used to switch one lamp or two alternating lamp circuits. **RFP1/A** As per **RFP1** except that the equal on and off time is adjustable from 0.02 to 3 sec. **RFP2** Fixed 90F/M 2 c/o			Upon application of supply voltage, cooling cycle starts, (4, 6, 8 or 12 hrs) followed by defrost cycle (1-60min). LINK 5-6: As above except defrost cycle starts first. **DET1/F**: Is for freezer rooms and has additional relay for fan delay (6-360 Sec). LEDs "defrost on" "fan on". Dip switch selection: cycle times 4 hour 6 hour 8 hour 12 hour		Upon application of the supply voltage the delay period begins. On expiry of the set time, the relay pulses on for 0.5 sec and a new time period begins. This repeating pulse continues until the supply voltage is disconnected. **RP1/R/PS** With Remote Potentiometer	
Connection Diagram												 RT for RP1/R/PS only	
Supply AC	Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Test volts 2kV)												
Supply DC	12, 24, 48VDC												
Specification	Output Rating: SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC Triac: 1000W (4A) @ 250VAC						Power Consumption: AC 1.5VA DC 100mA @ 12VDC						

See Page 1.6 for Time Ranges

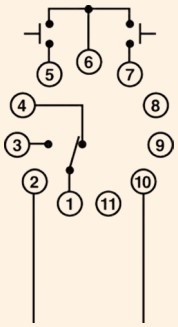
		FAILSAFE DESIGN 						
Type	**Alarm Relay 3I/P / 3O/P**	**Thermistor Relay**	**Single & Dual Alarm Relay**		**Differential Relay**		**Signal Converter**	
Code	**AL3**	**TH1**	**SAR1**	**DAR2**	**DIR**	**DIRV**	**SIC1†**	**SIC2†**
Outputs	4 x SPST	SPDT	SPDT	DPDT	SPDT		4-20mA	0-10V
Operation Mode	On closing of any input contact, the corresponding output relay and hooter will energise. By using a common flasher connect to Pin 11 lamp 1 will flash. By pressing the accept button the lamp will steady and remain on until the fault is removed, and the hooter will stop. More alarms can be added by merely commoning up more modules with no restriction. Pins to be common when expanding; 11,10, 9, 7 and common of hooter.	The relay is normally energised, when one of the thermistors reaches tripping temperature the relay de-energises. The relay will energise when the temperature drops to below trip level. **Latch facility** Link Pins 7-9. Relay remains de-energised after tripping. To reset, break supply voltage or operate N/C external reset device connected to Pins 7-9.	**SAR1: Single trip point** **DAR2: Two trip point** (2 relay outputs independently adjustable) The relay is normally de-energised and will energise when the input signal reaches the set level, set by a potentiometer. The relay will de-energise when the input signal drops below the set level by 3% The second alarm relay operates the same but set at a different trip level.		This module provides a relay output with high and low set points from an analogue instrument signal. The output relay will energise on the high set point and de-energise on the low setpoint offering a wide adjustable differential. When more than one unit is used in series and the supply is DC, an isolator must be used for each unit: **ISO-12VDC** **ISO-24VDC**		The Signal Converter modules convert various input signals to a 4-20mA or 0-10V DC signal. They are intended for use with all PLC and other instrumentation systems. **†Input selection** **A:** 0-5 Amps AC/DC **B:** 0-1 Amps AC/DC **R:** Ohms **V:** Voltage range AC/DC **Calibration:** For field calibration, energise module and set input to maximum. Adjust SPAN until output is 20mA/10V. Set input to minimum requirement and adjust ZERO until output is 4mA/0V. Calibration is complete. Red LED: Power on.	
Connection Diagram								
Specification	Lamp test Pin 7 Alarm accept Pin 9 Hooter Pin 8 To be utilised with relay flasher **RFP1** to Pin 11	Tripping resistance 1.2kΩ No. of thermistors to be connected in series not to exceed 1kΩ	Input signal: 4 - 20mA 0 - 20mA or 0 - 5VDC 1 - 5VDC		Input signal: 4 - 20mA 0 - 20mA } **DIR** or 0 - 5VDC 1 - 5VDC } **DIRV**		Inputs: **SIC*A:** 0-5 Amps, AC/DC **SIC*B:** 0-1 Amps, AC/DC **SIC*R:** 1-20kΩ **SIC*V 10V:** 0-10V, AC/DC **SIC*V 150V:** 0-150V, AC/DC **SIC*V 300V:** 0-300V, AC/DC **SIC*V 600V:** 0-600V, AC/DC * 1: for 4-20mA. 2: 0-10V output	
Power Consumption	DC: 600mA @12VDC	AC ± 1.5VA						
Supply AC	Not Available	Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Test volts 2kV)						
Supply DC	12, 24VDC, 48VDC	12, 24, 48VDC						
Contact Rating	SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC							

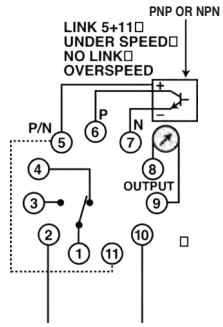
	FAILSAFE DESIGN 	FAILSAFE DESIGN 						
Type	**Namur Sensor Relay**	**Pivot Shut Down Relay**	**Centre Pivot Shut Down**	**Three Start Attempt Relay**	**Pulse Counter**		**Signal Isolator (Transducer)**	
Code	**NS1**	**VCT1**	**EVCT1**	**TSAP1**	**CO1**	**COT1**	**Input**	**Output**	**Code**
Outputs	SPDT	SPDT	SPDT	Start: SPDT Alarm: SPDT	SPDT		4-20mA	4-20mA	**SI-1A**
Mode of Operation	The Namur sensor relay converts the changing current of an Inductive or Capacitive Namur sensor into a relay switching. The sensor can be connected between 5 & 6 to energise the relay when the sensor is activated, or between 6 & 7 to energise the relay when the sensor is deactivated. See pages 15.20 or 15.24 for Namur sensors.	For use with centre pivot irrigation systems to prevent overwatering of the field. On application of voltage, the output relay energises for the adjustable start up delay period. Once running, if the pivot arm motors do not draw a minimum adjustable current within an adjustable time (usually 3 minutes for 20% watering), the output contact de-energises, switching off the Pump Start circuit.	Popular **VCT1** 11 Pin Plug in module mounted in an easy connect box. Add on kit to the existing centre pivot control panel to prevent overwatering should the pivot arm get stuck or the percentage timer misfunction. Supplied with **CT-5** with flying leads for simple installation.	Upon application of the supply voltage, the 'start' relay operates for a set 'on' duration followed by a set 'dwell' cycle. After the relay has operated for the no. of starts as per the dip switches and the supply voltage is still present, the 'alarm' relay will operate and this condition will prevail until the supply voltage is removed. Dip switch setting: 3-6 starts Start time: 0.5-30sec adjustable.	When the supply voltage is applied the relay remains OFF. The Pulse count is incremented on each closure (pulse) of switch 6-7. When the preset number of pulses is reached the relay switches on. At the next closure of switch 6-7 the relay is reset and the count cycle starts again. **No. of Pulses** 4 Link 9-11 5 Link 5-11 6 No link **COT1** Pulse Counter + Time Delay		4-20mA	0-10V	**SI-1A/V**	All outputs are galvanically isolated from inputs. Output: 4-20mA into 0-600 ohms load. Isolation between IP/OP and Mains = 600V
Connection Diagram								
Specification	Sensor current: 8mA Open voltage: 8.5V	For use with DIN type **CT-5** current transformer (see page 11.5) (Input 0-4V)		Supply Voltage: 9-30VDC standard Other Voltages available				
Power Consumption	AC: ±1.5VA DC: 100mA @ 12VDC						1.5VA	
Supply AC	Galvanic isolation with internal transformer 24, 48, 115, 230, 400, 525VAC ±15% (Isolation test volts 2kV)							
Supply DC	–	–		–	12, 24, 48VDC		–	
Contact Rating	SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC							

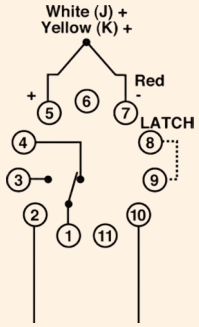
FAILSAFE DESIGN

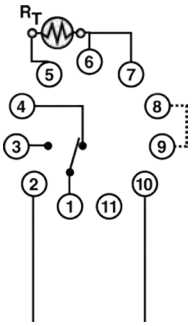
PROCESS CONTROLS

Coincidence Relay	Over/Under Speed & Tacho Relay		Temperature Relay for T/C: J & K		Temperature Relay for T/C: PT100		
CS1	**TM1**	**TM4 TM4/R**	**TRJ2 TRK2**	**TRJ4 TRK4**	SPDT	-20 to +80°C	**TR1**
					SPDT	0 to 100°C	**TR2**
					SPDT	+50 to 150°C	**TR3**
					SPDT	+50 to 200°C	**TR4**
SPDT	SPDT		SPDT	SPDT			
External contacts A and B typically are pushbuttons mounted 1m + apart on a press or guillotine. The operator must press both buttons, keeping his hands safely away, before the machine operates. Apply the supply voltage. The contacts A & B must be actuated within 0.5s in order to make the relay operate. If one of the contacts is interrupted the relay will immediately release. Ideal for use in machine safety guard systems.	The Tacho relay connects to a PNP,NPN or Namur inductive or capacitive sensor ***Under Speed:*** Link 5 & 11 The relay energises if input speed drops below the set limit. ***Over Speed:*** No link 5 & 11 The relay energises when the speed exceeds the set limit ***DIP SW:*** SW1 ON: NPN SW1 OFF: PNP ***Output TM4:*** SW2 ON: 4-20mA SW2 OFF: 0-20mA ***Ranges:*** Posn RPM Posn RPM 1 2-20 6 100-1k 2 5-50 7 200-2k 3 10-100 8 500-5k 4 20-200 9 1k-10k 5 50-500 10 2k-20k		0 to 200°C	0 to 400°C	**Link 8 & 9: (under temp)** The temperature relay connects to a temperature sensor PT100. The relay energises when the temperature exceeds the set limit. The relay de-energises when the temperature drops below the set limit. **NO Link 8 & 9: (over temp).** The relay energises on application of power and will de-energise when the temp. exceeds the set value.		
			TRJ2 & TRJ4 for J type thermocouple **TRK2 & TRK4** for K type thermocouple The temperature relay connects to a temperature sensor. The relay energises when the temperature exceeds the set limit. The relay de-energises when the temperature drops below the set limit. Remote control available on request. **AC Supply Only**				









	TM1 - 1mA Output **TM4** - 4-20mA Output 0-20mA Output **TM4/R** - Remote 1MV pot Hysteresis: 3% fixed Namur connect 6-7 NPN/PNP connect 5-6-7	Control: On/Off Proportional on request Latch: Pin 8 & 9 Hysteresis 3% fixed Faulty thermocouple Indication: Flashing LED	Overtemp: No link between Pins 8 & 9 Undertemp: Link 8 & 9 Hysteresis: 0 - 100%

AC: ±1.5VA DC: 100mA @ 12VDC

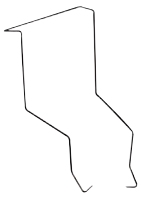
Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Isolation test volts 2kV)

12, 24, 48VDC

SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC

ACCESSORIES

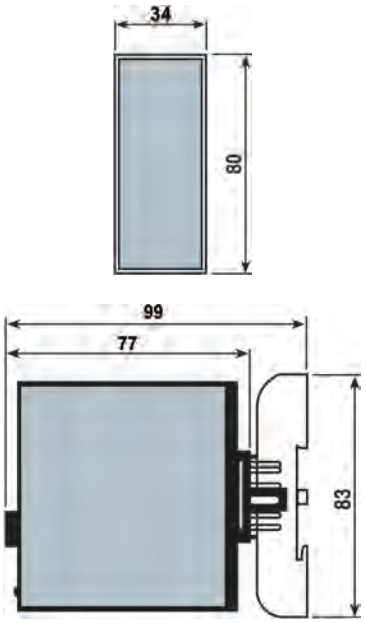
For Plug-In Modules



RC

BC

Accessories	Code
Timer box - Black	**A1024BK**
Retaining clip	**RC**
11 Pin base cover	**BC**
Remote pot. 1MΩ	**POT 1MEG**
Remote pot. 10kΩ	**POT 10K**



External dimensions (mm) A1024BK

Standard Time Ranges

0.02 - 1 sec	0.05 - 30 min
0.05 - 3 sec	1 - 60 min
0.20 - 10 sec	2 - 120 min
0.50 - 30 sec	3 - 180 min
1 - 60 sec	0.08 - 5 hours
3 - 180 sec	0.1 - 6 hours
6 - 360 sec	0.13 - 8 hours
10 - 600 sec	0.26 - 16 hours
0.25 - 15 min	0.4 - 24 hours

All timers, 11 Pin & 8 Pin, above 360 seconds: prices differ.

8-pin Plug-In Timers

The following 8-pin timers are available:
DP1, DP2, DP3, IP2, IP3, EP1, EP2, UP1, UP2, DDP1, DDP2, DDP3, DAP1, IAP1, SDP1, PP1, TSP1 & OSP1.

AUTOMATION

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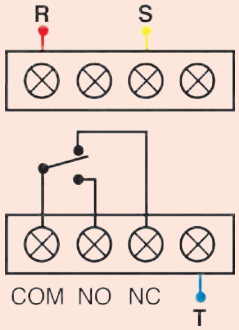
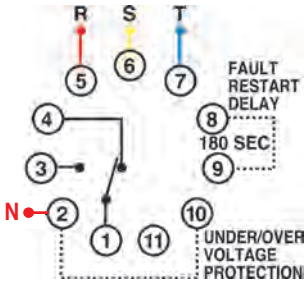
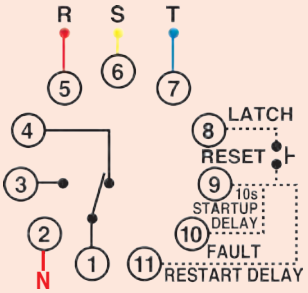
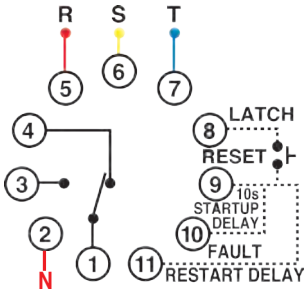
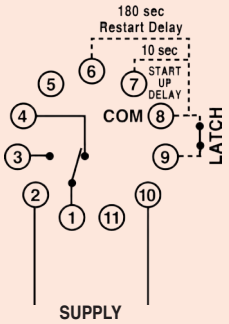
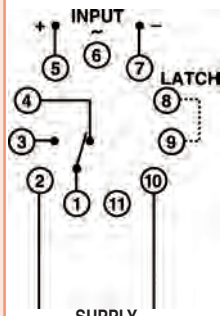
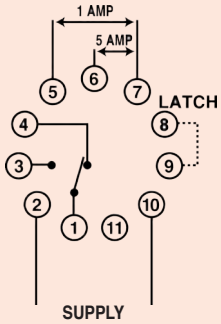
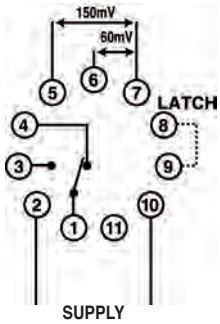
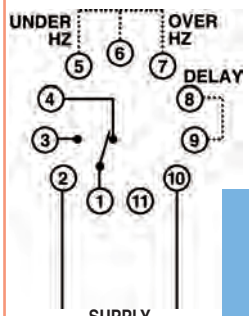
POWER MONITORS

Type	Phase Failure & Sequence Relay	Phase Failure & Sequence Relay		Supply Protection Relay		Over & Under Voltage Three Phase	
Code	SMP1 1000	SMP1 SMP1/N	SMP2 SMP2/N	SPR3	SPR3/N	TWCP1	TWCP1/N
Outputs	SPDT	SPDT	DPDT	SPDT		SPDT	
Mode of Operation	This three phase (3 wire) unit monitors the supply voltage for all systems between 525 and 1000V. The output relay energises if the phases are all present and in the correct sequence. The relay de-energises when any phase is lost or the phase sequence is incorrect. The unit is housed in a DIN rail mounting housing suitable for 1000V connections.	This three phase (3 or 4 wire) unit monitors the supply voltages. The output relay energises if the phases are all present, in the correct sequence and each voltage is within 5-15% range (adjustable) of each other. The relay de-energises on: a. A phase voltage imbalance exceeding the adj limit (5-15%). b. Total failure of one or more phases. c. Incorrect phase sequence. d. Supply exceeds 15% under/over nominal voltage (Link 2-10 options). Built-in optional facilities (**SMP1** & **SMP1/N** only) 1. 180 sec fault restart delay. 2. 15% fixed over/under voltage. These facilities can be utilised by connecting external links as per the diagram below.		**SPR3:** 3 Phase (3 wires) **SPR3/N:** 3 Phase + N (4 wires) This three phase (3 or 4 wire) unit monitors the supply voltage and combines the protection features of the **SMP1** and **TWCP1**. The output relay energises if the phases are all present, in the correct sequence and each voltage is to within the adjustable over and undervoltage limits. The relay de-energises on: a. Phase voltage imbalance exceeding the 10% (preset) b. Total failure of one or more phases. c. Incorrect phase sequence. d. Any phase falling outside the set voltage range. Built-in optional facilities: 1. External latch N/C 2. 10 sec start up delay 3. 180 sec fault restart delay These facilities can be utilised by connecting external links as per the diagram below.		**TWCP1:** 3 Phase (3 wires) **TWCP1/N:** 3 Phase + N (4 wires) This three phase (3 or 4 wire) window voltage comparator monitors the supply voltage. The output relay energises if the voltage level is within the adjustable over and undervoltage limits and de-energises when the voltage is outside this range. Built-in optional facilities: 1. External latch 2. 10 sec start up delay 3. 180 sec fault restart delay These facilities can be utilised by connecting external links as per the diagram below.	
Connection Diagram		 N: FOR **SMP1/N** ONLY		 N: FOR **SPR3/N**		 N: FOR **TWCP1/N**	
Specification	For any 3 phase system with a nominal voltage from 525 to 1000V. **LED:** Supply healthy – Green DIN mounting housing	**SMP1 & SMP2** – 3 Phase **SMP1/N & SMP2/N** – 3Phase + N Phase imbalance: 5-15% ADJ. **SMP1 & SMP1/N only** **Link 8 & 9** 180sec fault restart delay **Link 2 & 10 for SMP1 only** 15% fixed over/under voltage protection. **LED:** Supply healthy – Green Available for 110, 230, 400V and 525V systems		**Link 8 & 9** External latch **Link 9 & 10** 10 sec start up delay **Link 9 & 11** 180 sec fault restart delay. Phase imbalance: 10% fixed Overvolts 0 - 20% ADJ. Undervolts 0 - 20% ADJ. **LEDs:** Over/Undervolt – Red Phase rotation – Red x2 Supply healthy – Green		**Link 8 & 9** Ext. Latch N/C **Link 9 & 10** 10 sec start up delay **Link 9 & 11** 180 sec fault restart delay Overvolts 5 - 20% ADJ. Undervolts 5 - 20% ADJ **LEDs:** Over voltage – Red Undervoltage – Red Supply healthy – Green	
Hystersis	2% Fixed	2% Fixed		2% Fixed		2% Fixed	
Supply AC	525-1000VAC	115*, 230*, 400 & 525VAC		400 & 525VAC		115*, 400 & 525VAC	
Supply DC	-	-		-		-	
Contact Rating	SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC						

* For Use with VT's Only

FAILSAFE DESIGN

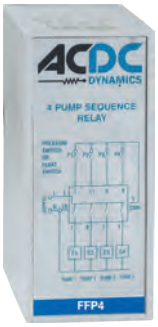
POWER MONITORS

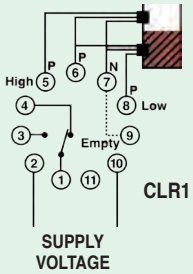
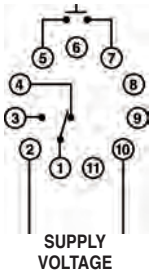
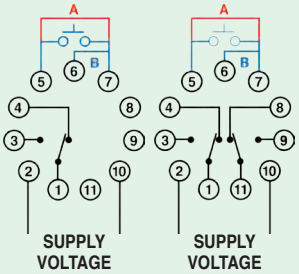
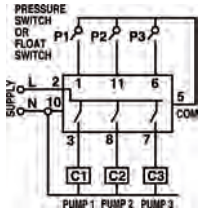
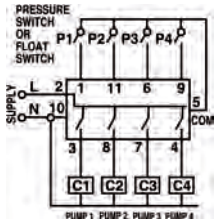
Over & Under Voltage Single Phase	Voltage Monitor		Over Current Monitor			Under Current Monitor		Over & Under Current Monitor	Over & Under Frequency Monitor
WCPT1	**VCP1**	**VCP1/M**	**OCP1**	**OCP1/R**	**OCP1/D**	**UCP1** **UCP1/E**	**UCP1/D** **UCP1/R**	**CWP1**	**FR1**
									
SPDT	SPDT		SPDT			SPDT		SPDT	SPDT
This new single phase window voltage comparator replaces **WCP1** and monitors the supply voltage. The output relay energises if the voltage level is within the adjustable over and undervoltage limits and de-energises when the voltage is outside this range. Built-in optional facilities: 1. External latch 2. 10 sec start up delay 3. 180 sec fault restart delay These facilities can be utilised by connecting external links as per the diagram below.	The output relay is energised when the voltage peak (peak voltage on AC) overshoots the level selected on the front face potentiometer. It de-energises when voltage falls below the normal voltage Ue by 5-50% or when supply breaks. The hysteresis is adjustable and its selection does not change the chosen voltage level.		**OCP1 -** 1A/5A AC/DC **OCP1/R -** As **OCP1** with Remote Potentiometer **OCP1/D -** 60mV/150mV AC/DC Trip Point - The relay de-energises when the input current rises above the set point and energises when the input current falls a certain percentage (hysteresis) below the set point. Hysteresis - The difference between the trip level and the set level.			**UCP1 -** 1A/5A AC/DC **UCP1/R -** As **UCP1** with Remote Potentiometer **UCP1/E -** As **UCP1** But no Delay **UCP1/D -** 60mV/150mV AC/DC Trip Point - The relay de-energises when the input current drops below the set point and energises when the input current rises a certain percentage (hysteresis) above the set point. Hysteresis - The difference between the set trip level and the recovery level.		**CWP1 -** 1A/5A AC/DC The relay senses the input current and the relay will energise, if the current is within the set overcurrent and undercurrent. The relay will de-energise if the current rises above the overcurrent setpoint or drops below the under-current set point. **LEDs:** Over current – Red Under current – Red Supply on – Green	The unit senses the supply frequency and the relay will energise if the frequency is within the set over frequency limits. The relay will de-energise if the frequency rises above the over frequency setpoint or drops below the under frequency set point. Link 6 & 5: Under Hz Link 6 & 7: Over Hz
								
Link 8 & 9 External latch N/C **Link 8 & 7** 10 sec start up delay. **Link 8 & 6** 180 sec fault restart delay. Overvolts 5 - 30% ADJ. Undervolts 5 to 30% ADJ. **LEDs:** Over voltage – Red Under voltage – Red Supply healthy – Green	**VCP1/M: Multi voltage inputs:** Connect: 5-8 0 -10VAC(RMS)/DC 6-8 0.4 -40VAC(RMS)/DC 7-8 4 -400VAC(RMS)/DC 11-8 6 -600VAC(RMS)/DC (For detailed wiring diagram, see www.acdc.co.za)		**UCP1** **OCP1** **CWP1** Input: AC: 0 - 1A Pins 5 +7 0 - 5A Pins 6 +7 Startup delay: 10 seconds For external pot use 10kV			**UCP1/D** **OCP1/D** DC: 0 - 150MV Pins 5 +7 0 - 60MV Pins 6 +7		Response delay: 1 sec Over: 52 - 58Hz adjustable Under: 48 - 42Hz adjustable **LEDs:** Over frequency – Red Under frequency – Red Supply on – Green
2% Fixed	5 - 50% Adjustable		5 - 50% Adjustable					2% Fixed	2% Fixed
Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Isolation test volts 2kV)									
12, 24, 48VDC (110VDC for **VCP1**) (**WCPT1** Not available in 12VDC)									-
SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC									

AUTOMATION

LEVEL & PUMP CONTROL

FAILSAFE DESIGN



Type	Capacitive Level Relay		Flip-Flop Relay Pulse Start			Flip-Flop Mains Controlled		Pump Sequence Control Relay	
Code	CLR1	CLR2	FNCP1	FNCP2	FFCP1	FFP1	FFP2	FFP3	FFP4
Outputs	SPDT		SPDT	DPDT	SPDT	SPDT	DPDT	3 Pumps	4 Pumps
Mode of Operation	**CLR1** **Using NPN Probe** ***Filling:*** The relay energises when the level drops below the lower level sensor and de-energises when it reaches the high level sensor. ***Emptying:*** As above with opposite function. Link 7 & 9. **Using PNP Probe** Functions reverse. NPN Sensor: **SD10G-ARN1** Page 2.4 NPN Sensor: **CS-09** page15.30 **CLR2** 2 Wire Probe connection: Probe 1 5(+) 6(–) Probe 2 7(+) 6(–) Probes **VR1A** or **VR1B** page 2.4 Single Probe connection: Probe 5(+) 7(–)		**For alternating pumps** **FNCP1** (No memory) Closing of contact across 5 & 7 the relay will energise. Closure of contact again, the relay will de-energise. When the relay is in the ON position and the supply voltage is removed, the relay will reset. (No memory). **FFCP1** (With memory) Closure of contact across 5 & 7, the relay will energise. On closure of the contact again the relay will de-energise. The relay remains in this position even on removal of supply. (with memory).			**Mains controlled: Change on removal of supply.** The relay is initially in any state, on or off, apply supply voltage. The relay keeps its state. Remove the supply voltage. The relay will now change state and will keep its state without the supply. Apply & remove the supply again for the next change in state. **Mains controlled: Change on application of supply.** Link pins 5 and 7 (Link A). Apply supply voltage. The relay changes state. Remove supply. The relay keeps its state. **Pulse controlled.** Link pins 6 & 7 (Link B). The relay is initially in any state, apply supply voltage. The relay keeps its state. When the contact between pins 5 & 7 closes, the relay will change state. Remove the supply voltage. The relay will keep its state without the supply. Minimum time supply connected for relay to react: 1 second.		Float or Pressure switches are connected to pins 1, 11, 6 and common on 5. When the first switch closes, relay 1 energises. When the second and third switches close, the second and third relays energise. There will always be as many relays energised as there are input switches closed. When 1, 2 or 3 pressure switches open, 1, 2 or 3 relays will de-energise. The positions of the pressure switches do not matter, only how many are switched on at a time. When all switches open and no relays are energised, and a switch closes again, then relay 2 will be the primary relay, that is the first relay to energise, then relay 3, and then relay 4 or 1. Every time the first switch closes, the next relay will be the first to energise. The supply must be connected for the relays to energise. The currently selected primary relay is stored in non-volatile memory. The relay will remember which relay to energise first, even if the supply is disconnected.	
Connection Diagram								NB: Voltage Free Inputs FFP3  FFP4 	
	Response time: 500mS Sensor connections NPN: Pin 5 (P) H Level - Black Pin 6 (P) Common - Brown Pin 7 (N) Common Blue Pin 8 (P) L Level - Black Use **SD10G-ARN1** or **CS09** page15.30		**FFCP1**: Not available in 12VDC			Response time: 0.2S Not available in 12VDC			
Power consumption	AC: ± 1.5VA DC: 100mA @ 12VDC								
Supply AC	Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15% (Isolation test volts 2kV)								
Supply DC	12, 24, 48VDC								
Contact Rating	SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC								

AUTOMATION

FAILSAFE DESIGN

LEVEL & PUMP CONTROL

PHASE ANGLE RELAYS

2-Level Liquid Level Relay

TE101	TE201
SPDT	DPDT

Filling: Link 7 & 8. The relay energises when the level drops below the low level probe and de-energises when it reaches the high level probe. Top and bottom probes are interchangeable.
Emptying: No link between 7 & 8. The relay energises when the level reaches the high probe and de-energises when it drops below the low probe.

- For single level sensing connect pins 5 & 6 (Probes 5 & 7).
- 1s response time to limit effect of water ripple. Longer times manufactured to order.

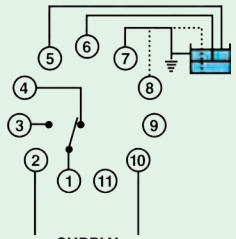
TE101: Filling or Emptying

TE201: Emptying Only

TE101B: Dual voltage 230/400V

TE101LE: Long Distance
Emptying 150-200m
230V and 400V only-

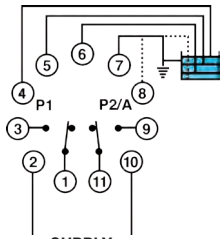
For Probes, see Pg. 2.2



3-Level Liquid Level Relay

DLR	DLRA
DPST	

DLR
For alternating pumps
There are two relay outputs with flip-flop action each cycle for alternating duty of pumps. Relay is connected to four probes.
Filling: Link 7 & 8. Pump 1 starts when the level drops below the start level probe. Pump 2 will start if the level drops to the second probe. Both pumps run until tank is full. The next cycle pump 2 first then pump 1.
Emptying: No link between 7 & 8. Function as above but reversed.
DLRA
For one pump & alarm
Output relay energises and de-energises between 2 levels like **TE101**. When extreme level is reached, the alarm output energises (2nd Relay). Alarm can be used for high or low function.
For Probes, see Pg. 2.2

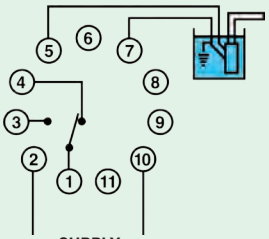


Submersible Pump Seal Monitor

SPSM1	SPSM2	SPSM1-5K
SPDT	DPDT	SPDT

For protection of submersible motors against damage caused by the ingress of water.
Terminals 5 & 7 connect to the monitoring terminals on the submersible motor.
The output relay energises upon application of power. The relay will de-energise if probe current is more than 20μA or if probe resistance is less than 1Mohm. The relay will energise if probe current is less than 15μA or if probe resistance is more than 1,4Mohm.

SPM1-5K: 5KΩ Sensitivity Potentiometer



Level sensor:
Probe volts 5 VAC @ 1.5mA
Adjustable sensitivity: 0 - 50 kΩ

Max Voltage on probe = 24VDC
Max Current through probe = 120μA = 0.12mA.
LEDs:
Power on – Red
Seal healthy – Green

AC: ± 1.5VA DC: 100mA @ 12VDC

Galvanic isolation with internal transformer 12, 24, 48, 115, 230, 400, 525VAC ±15%
(Isolation test volts 2kV)

12, 24, 48VDC

SPDT: 10A @ 250VAC DPDT: 5A @ 250VAC

Pump & Motor Protection Phase Angle Relays

TE01 / TE01/S	TE02 / TE03

- Supply Voltage: Single Phase: 230VAC ±20%
  Three Phase: 400VAC, 415VAC (**TE02** & **TE03**) or 525VAC ±20%
- Power Consumption: ±2VA
- Calibration: Manual or Automatic (Model dependant)
- Dry Trip Level: 10% of calibrated phase angle / current 2s delay
- Dry Restart Delay: 15 minutes to 5 hours adjustable
- Output Relay: SPDT 250VAC/10A
- Voltage Trip Level: 10% of calibrated voltage, 2 second delay (**TE02/TE03**)
- Current Trip Level: 20% of calibrated current, 1 second delay (**TE02/TE03**)
- Rapid start cycle: 3 per 15 minutes maximum (**TE03** only)

LED Status Indication TE02/TE03

Green	Amber	Red	Condition
ON	OFF	OFF	Normal pumping
FLASH	OFF	OFF	Dry-timing or phase failure/reversal
OFF	ON	OFF	Supply voltage low/high
OFF	FLASH	OFF	Rapid cycle
OFF	OFF	ON	Motor overload or phase failure
ON	ON	ON	**TE02/3** uncalibrated
FLASH	FLASH	FLASH	**TE02/3** calibrating
OFF	OFF	OFF	Unable to calibrate

Selection Guide

Code	TE01*	TE02*	TE03*
11 Pin Plug In	●	●	●
Running dry- Under load blocked in/outlet	●	●	●
Overcurrent		Auto	Auto
Phase Failure / Reversal		●	●
Over / Under voltage		●	●
Star / Delta or Soft Start	●**	●	●
Locked Rotor		●	●
Shunt Required	●		
Rapid pump start protection			●
Cut-out over 12 starts/hour			●
LED Status Indication		●	●
Calibration	Manual	Auto	Auto
Tank Control (float switch)			●

*Add to Code: **230V** (230VAC), **400V** (400VAC), **415V** (415VAC), **525V** (525VAC) ****TE01/S** version only

AUTOMATION