

# SIEMENS

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## Smart. Easy. Reliable.

Monitoring Relay 7UG0 and Timers 7PV0

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# Smart. Easy. Reliable.

The continuity of electrical power supply is very important especially for the industrial sector where a stoppage of process is extremely costly. Thus it is extremely important to take necessary action to prevent the faults in the system, however if the faults still occur, it is imperative that we take sufficient care to minimize the potential damage to life, equipment and property.

With 7UG0 monitoring relays & 7PV0 timers, Siemens offers a smart, reliable and economical solution to monitor and control motors and machines.

The 7UG0 monitoring relays provide protection for machines, plants and systems. These relays detect current and voltage faults early and initiate appropriate response to prevent any significant damage.

The monitoring relays enables shutdown of the affected section of the plant by means of a relay output and also raises an alarm. The monitoring relays have settable time delays to respond flexibly to short-term disturbances such as voltage dips or load variations. This avoids nuisance alarms and unplanned shutdowns, which enhances plant availability and profitability



# 7UG0 Monitoring Relays

## Range:

- Line monitoring relays
- Voltage monitoring relays
- Earth leakage relay
- Current monitoring relays
- Temperature controlling relay
- Earth fault monitoring relays
- Thermistor motor protection relay New
- Speed monitoring relay New
- Water level controller relay New

Relay	MLFB	Ø	Phase failure protection	Imbalance protection	Phase reversal protection	Under voltage protection	Over voltage protection	Under freq protection	Over freq protection	Earth leakage protection	Under current protection	Over current protection	Earth fault	Input for TC
Line monitoring relay	7UG0 712	3Ø 3W	✓	✓	✓									
	7UG0 818	3Ø 3W / 3Ø 4W	✓	✓	✓	✓	✓	✓	✓					
Voltage Monitoring relay	7UG0 753	3Ø 3W	✓		✓	✓	✓							
Current Monitoring relay	7UG0 82	1Ø 2W	✓	✓							✓	✓		
	7UG0 83	1Ø 2W / 3Ø 3W / 3Ø 4W	✓	✓							✓	✓		
Earth leakage relay	7UG0 84	1Ø 2W / 3Ø 3W / 3Ø 4W								✓				
Earth fault monitoring relay	7UG0 86	1Ø 2W / 3Ø 3W / 3Ø 4W											✓	
Temperature controller (TC)	7UG0 48													TC / RTD

## New

Relay type	MLFB	Sensor type
Thermistor motor protection relay	7UG0 881	PTC
Speed Monitoring relay	7UG0 583	5 to 30VDC from proximity switches, Solid state devices Encoders Potential free contacts
Water level controller relay	7UG0885	Conductive sensor probes: Stainless Steel

## Features:


- Monitoring of electrical parameters viz: Phase sequence  
Phase imbalance, Phase Failure
- Protection from under / over current / voltage and unbalance / asymmetry
- LCD display for 35mm width product
- Din rail mounting except TC which is Panel mountable
- Compact dimensions

## Benefits:

- Wide sensing range leads to fewer variants – optimized inventories
- Durable and maintenance free product
- DIN rail mounting – Quick & Easy Installation
- Giving uniformity and better aesthetics
- Reliable protection from voltage and leakage current
- CE and RoHS compliant

### Standards and approbations:

The 7UG0 range conforms to IEC 60947-4-1 & IEC 60947-5-1.

They also carry  mark

### Applications:

The 7UG0 ranges of monitoring relays are suitable for variety of applications.

These relays can be used for monitoring of balanced and unbalanced supplies in AMF panels, PCCs, Distribution boards and for monitoring of individual Motors / Pumps.

They provide reliable protection of motors from hazards like single phasing; phase reversal and system unbalance. They also safeguard the machine / motor from the system stress viz: under and over voltages, residual current and earth fault etc.

These relays find application across Industries in wide range of machine and tools.



Air conditioning & compressors



Lifts  
Passenger transport



Transportable systems



Automotive industry



Lighting control



Plastics processing machines



Building systems



Food & Beverages

### Line monitoring relay:

Line monitoring relays are suitable for monitoring of incoming 3phase 3wire and 3phase 4wire supply. These relays are capable of monitoring Phase imbalance, Phase reversal, Phase failure and Frequency variations. The relays are independent of load and can be used for any ratings. They can be used in all the applications where the monitoring of mains supply is essential like AMF/Transfer switch panels, air conditioning control panels, Pump control panels, lifts / hoists control panels etc.

### Voltage monitoring relay:

Voltage monitoring relays are suitable for monitoring of balanced or unbalanced 3phase 3wire supplies. These relays find applications where, even a dip or a long surge in the system is harmful and can damage the equipment associated to it. These relays can be used in all electrical systems for e.g. loads powered by Generators, UPS, stabilizers, Inverters or by Electricity boards; in AMF panels, PCCs, MCCs & for monitoring of individual loads/motors/ pumps etc.

### Earth leakage relay / Earth fault monitoring relay:

These relays are used to protect electrical system from fire and other electrical hazards. The unit consists of two parts: Basic relay & core balance current transformer (CBCT). This CBCT is used to sense the leakage / fault current of the electrical System. The secondary of the CBCT is wired to the basic relay. If earth leakage / fault current exceeds than the set value, the electromagnetic relay is energized which can be used for tripping MCCB / OCB / ACB or any other device.

### Current monitoring relay:

Current monitoring relays are suitable for monitoring of balanced or unbalanced 3phase and single phase loads. These relays find applications where the load fluctuations are frequent and if not acted upon at appropriate time can damage the equipment associated to it. These relays can be used in all electrical systems for e.g. loads powered by Generators, Pumps, Conveyors, AMF panels & for monitoring of individual loads/motors etc.



## Monitoring Relays: Technical data

			Line monitoring relay		Voltage monitoring relay	Current monitoring relay	Earth Leakage monitoring relay	Earth fault monitoring relay	
			7UG0712-1AA20	7UG0818-1CA20	7UG0753-1AA20	7UG0 821-1AB20, 7UG0 822-1AD20 & 7UG0 831-1AB20, 7UG0 832-1AD20	7UG0841-1CB20 & 7UG0842-1CD20	7UG0861-1BU20	
Main Circuit	Rated Insulation Voltage [Ui]	Ui (V) AC	480	500	480	300	300	300	
	Rated system supply voltage [Ue]	Ue (V) AC	415			230/240 for 7UG082.. 415 for 7UG083..			
	Operating band	V / I	154 - 480V (L-L)	280 - 500V AC (L-L) 160 - 288V AC (L-N)	310 - 480V AC (L-L)	1A - 999A AC (with External CT)	10mA - 30A	10% - 80% of CBCT current	
	Rated Control supply (Aux. voltage)	V	Built-in			110 / 230 V AC ±15%	110 & 240 V AC +/- 15%	85...270AC/DC	
	Rated Impulse Withstand Voltage [Uimp] (For Overvoltage Category II)	kV	2.5	4	2.5	2.5	2.5	2,5	
	Rated Frequency	Hz	50/60						
	Pollution Degree For PCB For Product		2 3						
Current/ Voltage Range	Measuring range (RMS value)	V / A	154 - 480 V AC	10 - 500 V AC (L-L) 10 - 288 V AC (L-N)	310 - 480 V AC	0--1.19 kA	4mA - 30A	1A...630A	
	Setting range	V / A	fixed	280 - 500 V AC (L-L) 160 - 288 V AC (L-N)	310 - 480 V AC	Pri: 1A...999A  Sec: 1A / 5A	10mA - 30A	CT Primary: 160A, 250A, 630A and Trip Setting (Earth Fault) 10% - 80% of rated current	
Response	Response time maximum	ms	200	<200ms	<200	<200ms	<30ms for >/- 5x set value <50ms for >/- 1x set value	<100	
	Recovery time	ms	<300ms	0 -99.9 sec (Settable)	<300ms	< / = 300ms (On removal of fault)	0 -99.9 sec (Settable)	0-99.9sec (In auto reset mode)	
	Accuracy	%	±3% of FS for Time	±5% of setting + 200ms ±1% of setting for Voltage ±0.3% of setting for Frequency	±5% of FS for Time ±1% of FS for Voltage	±1% of Setting ±2 Digit for Current ±5% of Setting + 200ms for time - Recovery Time, Trip Delay, Power ON Delay	±5% of setting + 100ms ±5% of setting for current	Current: ± 5% of setting + 2 digits Time: ± (5% of Setting + 100ms)	
	Power consumption	VA	22 VA	30VA max	22 VA	15VA	3VA max	4VA Max	
Endurance	Mech endurance operating cycles	(mio)	10	10	10	10	10	10	
	Elect endurance AC15:3A @ 250V AC (900 ops./hr)	(mio)	0.1	0.1	0.1	0.1	0.1	0.1	
	Ambient temperature (Operational)	° C	0 to 50	0 to 50	0 to 50	0 to 50	0 to 50	0 to 50	
	Ambient temperature (storage)	° C	-20 to +70	-20 to +70	-20 to +70	-20 to +70	-20 to +70	-20 to +70	
	Screw tightening torque	NM	0.6	0.5	0.6	0.5	0.5	0,5	
	Conductor cross section (Solid)	Sq mm	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	
	Conductor cross section fine stranded with end sleeve	Sq mm	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	1 x (0.5 to 2.5) 2 x (0.5 to 1.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	
Degree of protection of Device		IP20							

			Line monitoring relay		Voltage monitoring relay	Current monitoring relay	Earth Leakage monitoring relay	Earth fault monitoring relay
Network	Protection (AC network)	1Ø - 2W	–	–	–	√	√	√
		3Ø, 3W	√	√selectable	√	√	√	√
		3Ø, 4W		√selectable		√	√	√
Features	Pre-warning	A				–	Y(50-100%)	Yes (50-100%)
	CBCT error	A				–	√	
	Earth Leakage / Fault trip setting	A				–	10mA--30A	10% to 80% of FLC
	Phase failure	V	√	√	√	–	–	–
	Phase reversal	V	√	√	√	–	–	–
	Phase imbalance / Current Assymetry	V / I	30V fixed	5 - 99.9%	–	√		
	Under voltage/ Under current protection	V / A		280-500 V <sub>L-L</sub> for 3Ø, 3W 160-288 V <sub>L-N</sub> for 3Ø, 4W	310 - 405V	0---999A		
	Over voltage/ Over current protection	V / A		280-500 V <sub>L-L</sub> for 3Ø, 3W 160-288 V <sub>L-N</sub> for 3Ø, 4W	425 - 480V	0.5A---1.19KA		
	Under freq protection	Hz		45 - 65		–		
Over freq protection	Hz		45 - 65		–			
Reset	Auto/ Manual / Remote		A	A/M	A	A / M	A/M/R	A/M/R
Delay	Hysteresis	V / A	6V	1 - 99 for V 0.2 - 2 for Hz 2 - 2-% for Asymmetry	2V	0.1--99.9A	5 - 40 % of set value	1 to 10% of Fault current setting
	Power on delay	s	200 ms	2 - 99.9s	400ms	0.5--99.9s	0.5 - 99.9s	0.5--99.9s
	Trip time delay	s	Fixed	0 - 99.9s	0.2 - 10	0--99.9s	0 - 99.9s	0--99.9s
	Recovery time setting	s		0 - 99.9s		0---99.9s	0 - 99.9s	0---99.9s
Output	Max current (Ith)		5A			5A	5A	
	Contacts @ AC 15, 250VAC	1C/O	3A / 250V		3A / 250V	3A / 250V		
	Contact s @ AC 15, 250VAC	2x 1C/O		3A / 250V		–	3A / 250V	3A / 250V AC
	Contacts @ AC 12, 250VAC	1C/O	5A / 250V		5A / 250V	5A / 250V		
	Contact s @ AC 12, 250VAC	2x 1C/O		5A / 250V			5A / 250V	5A / 250V
	Terminal Connections		Screw					
Display		Green LED on: Power ON Green LED off: Fault indication	"ON" LED: Power ON "R1" LED: Fault in Relay 1 "R2" LED: Fault in Relay 2 LCD: Parameters & Fault type	Green LED on: Relay ON Red LED on: Power ON	LED "ON": Power on "R1" LED: Fault in relay LCD: LCD: Parameters & fault type	"ON" LED: Power ON "R1" LED: Fault in Relay 1 "R2" LED: Fault in Relay 2 LCD: Parameters & Fault type	LCD with Backlight	
Dimensions	Width	mm	17.5	35	17.5	35	35	35
	Depth	mm	60	70.5	60	71	70.5	70.5
	Height	mm	90	90	90	90	90	90
	Weight	g	62	135	62	135	207	207
	Mounting Orientation		35mm DIN rail any					
Accessories			–	–	–	Additional Requirement: External CT, Class 0.5: 1A/5A secondary	CBCT	CBCT
Certificates	Approbation		CE					
	Standard Compliance		IEC 60947-4-1 & IEC 60947-5-1			IEC 60947-5-1	IEC 60947-4-1 & IEC 60947-5-1	IEC 60947-4-1 & IEC 60947-5-1

			Temperature Controller relay
			<b>7UG04801IU20</b>
Main Circuit	Rated Insulation Voltage [Ui]	Ui (V) AC	300
	Rated Control supply (Aux. voltage)	V	85 - 270 AC / DC
	Rated Impulse Withstand Voltage [Uimp]	kV	4
	Rated Frequency	Hz	50/60
	Power consumption @ 230VAC	VA	Max. 6
	Humidity	RH	upto 95%RH (Non-condensing)
	Pollution Degree For PCB For Product		2 3
Input specifications	Sensor Inputs		Thermocouple (J,K,T,R,S) / RTD (PT100)
	Filter time	sec	0.2 to 10 sec
	Sensor Resolution	°C	0.1/1°C for TC / RTD input (fixed 1°C for R,S type TC input)
	Temperature indication		°C/°F selectable
	Display accuracy		For J, K & T inputs: <b>2% of setting ± 1°</b> For R & S inputs: <b>2% of setting ± 2°</b> (20 min of warm up time for TC inputs) For RTD inputs: <b>2% of setting ± 1°</b>
Functions Specification	Control Method		1) PID control with auto tuning 2) ON-OFF control 3) Heat - Cool (with auto tuning)
	Propositional band (P)	°C	1.0 to 400.0
	Integral time (I)	sec	0 to 9999
	Derivative time(D)	sec	0 to 9999
	Cyclic time	sec	0.1 to 99.9
	Hysteresis width	°C	0.1 to 99.9°
	Manual reset value	°C	-19.9 to 19.9°
	Heat cool PID		Control Action: PID (with auto tuning) Propositional cool band (P): 0.0° to 400° Cyclic cool time: 0.1 to 99.9 sec Dead band: Programable from set point low limit to high limit Derivative time(D): 0 to 9999 sec
Endurance	Mech Endurance	(mio)	4
	Elect Indurance AC15 @ 250V AC (900 ops./hr)	(mio)	0'05
	Ambient temperature (Operational)	° C	0 to 50
	Ambient temperature (storage)	° C	-20 to + 75
	Screw tightening torque	Nm	0.5
	Conductor cross section (Solid)	Sq mm	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5
	Conductor cross section fine stranded with end sleeve	Sq mm	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)
	Degree of protection of Device		IP20 (Front)



			Temperature Controller relay
Output	No. of Control		Max. 2
	Max current (Ith)		5A
	Relay contact @ AC15, 250VAC	2x 1C/O	2A / 250V
	Relay contact @ AC12, 250VAC	2x 1C/O	5A / 250V
	Digital output for external SSR		12V DC ± 50mA
	Output selection		User selectable Relay or SSR
	SCPD for relay output (For Short circuit current of 1kA as per IEC 60947-5-1)		6A, gL, HRC fuse
	Terminal Connections		
	Screw		Y (M3.5)
	Spring		No
	Display		4 Digit, 7 segment LED
Dimensions	Width	mm	52
	Depth	mm	79
	Height	mm	52
	Weight	g	135
	Mounting		Panel mountable
Accessories	Sensors		N
Certificates	CE		Y
	Standard Compliance		IEC 60947-5-1

# Thermistor motor protection relay



Temperature is a critical parameter of motor to be monitored. There can be many causes of abnormal temperature rise like high current, imbalance, single phasing, higher ambient temperature, insufficient cooling etc. Abnormal temperature rise may lead to rupturing of winding insulation which may lead to inter-turn shorting and ultimately failure of the motor. Generally an overload relay is used for motor protection which monitors current. This can help in detecting temperature rise because of high current, phase imbalance & single phasing but other causes like higher ambient temperature, insufficient cooling etc. cannot be monitored by an overload relay. Hence to provide quick and complete protection, it is recommended to monitor the temperature of motor windings directly. It is achieved by putting PTC thermistors in motor winding and monitoring the thermistor resistance by thermistor motor protection relay.

## Features

- Universal control supply 110V-240V AC/DC
- Indication for Sensor state- Healthy, trip, open & Short
- Indication for Over temperature
- Remote reset available
- As per IEC 60947-8
- CE and RoHS compliant

## Applications

- Heavy starting (e.g. centrifuges pumps)
- Electromechanical frequency converters
- Impeded cooling, e.g. due to soiled environment (paper and textile industry, cement, steel works)
- Heating installations
- Cutting and Drilling Machines

Parameters	Units	
<b>Product type</b>		Thermistor Motor Protection relay
<b>MLFB</b>		7UG0881-1BU20
<b>Main Circuit</b>		
Rated Insulation Voltage [Ui]	V AC	300
Rated Control supply (Aux. voltage) Uc	V	110 - 240 AC / DC
Tolerance on Control Supply		0.85x Uc...1.1x Uc
Rated Impulse Withstand Voltage[Uimp] (For Overvoltage Category II)	kV	2.5
Rated Frequency	Hz	50/60
Humidity (non-condensing)	%RH	95
Pollution Degree For PCB For Product		2 3
Max. Power consumption	VA	3
Ambient temperature (Operational)	° C	0 to 50
Ambient temperature (storage)	° C	-20 to +70
Degree of protection of Device		IP20
<b>Function</b>		
Types / Modes		Sensor - PTC's
Modes / Operating range / Features		Sensor Short: ≤ 40 Sensor Healthy: ≥ 44 (±3) to < 3.8K (±150) Sensor Trip: ≥ 3.8K (±150) to < 5.5K (±150) Sensor Open: ≥ 5.5K (±150) & Above Sensor Recovery/ Cut-in / Reset: ≤ 1.5K (±60)
<b>Response &amp; Delays</b>		
Response time	mS	<100
Recovery time		Instantaneous after cooling (For Auto mode)
Accuracy		As defined above
Hysteresis		As defined above
Power on delay	s	<3
Trip time delay	s	Instantaneous
<b>Indications</b>		
Over Temperature		Yes
Sensor detection		Yes (Healthy / Trip / Open / Short)
Display		LED for Power ON, Sensor and Relay indication
Reset		Auto / Manual / Remote

Parameters	Units	
<b>Output</b>		
Contact configuration		2x 1CO
Mechanical life (operating cycle)		5 X 10 <sup>6</sup>
Electrical life (operating cycle) (AC15: 250V/2A @ 900 op/hr)		70,000
Max current (Ith)	A	5
Contact @ AC 15, 250VAC	A	2
Contact @ AC 12, 250VAC	A	5
SCPD	A	6A gG HRC Fuse
<b>Terminal Connections</b>		
Screw tightening torque	Nm	0.5
Conductor cross section (Solid)	mm <sup>2</sup>	1x (0.75 to 2.5) 2x 0.5 to 2x 1.5
Conductor cross section (stranded with end sleeve)	mm <sup>2</sup>	1x (0.5 to 2.5) 2x (0.5 to 1.5)
Screw		M3
<b>Dimensions</b>		
Width	mm	35
Depth	mm	60
Height	mm	90
Net Weight	gms	110
Mounting		35mm DIN rail
Orientation		any
Accessories (in packing)		NA
<b>Markings &amp; Standards</b>		
CE & RoHS		Y
Standard Compliance		IEC 60947-5-1, IEC 60947-8 A

# Speed Monitoring Relay



The speed monitoring relay monitors a motor for exceedance of the upper and lower limit via a sensor attached to the motor, which supplies one pulse per rotation. A speed signal edge is evaluated to also ensure the reliable detection of motors and systems in idle states. Thanks to a scaling factor, multiple pulses can be detected per rotation for accurate measurement with extremely slowly rotating motors while still measuring the present speed correctly.

## Features

- LED display for quick access of speed
- Wide range of control supply 110V-240V AC/DC
- Sensor type for count input:- encoder, PNP, NPN, potential free contact
- User selectable operating range:- RPS, RPM, RPH
- Settable upper/lower limit exceedance or band monitoring
- Separate relay output for under-speed and over-speed
- Detection of multiple pulses per rotation with extremely slowly rotating motors
- Integrated sensor power supply

## Applications

- Monitoring for belt breakage or slippage of conveyor
- Packaging machines
- Process plant
- Assembly lines
- Milling machine

Parameters	Units	
<b>Product type</b>		Speed Monitoring relay
<b>MLFB</b>		7UG0583-1CU20
<b>Main Circuit</b>		
Rated Insulation Voltage [Ui]	V AC	300
Rated Control supply (Aux. voltage) Uc	V	110 - 240 AC / DC
Tolerance on Control Supply		0.85x Uc...1.1x Uc
Rated Impulse Withstand Voltage [Uimp] (For Overvoltage Category II)	kV	2.5
Rated Frequency	Hz	50/60
Humidity (non-condensing)	% RH	95
Pollution Degree For PCB For Product		2 3
Max. Power consumption	VA	3.2
Ambient temperature (Operational)	° C	0 to 50
Ambient temperature (storage)	° C	-20 to +70
Degree of protection of Device		IP20
<b>Function</b>		
Types / Modes		Rate Indicator: Under / Over / Dual Speed Mode: RPS,RPM,RPH
Modes / Operating range / Features		Auto-Ranging resolution Scale factor Initial Bypass time delay Nuisance time delay Range: 0 - 166 RPS / 0 - 9960 RPM
<b>Response &amp; Delays</b>		
Response time	mS	<100
Recovery time		Instantaneous after normal speed (For Auto mode)
Accuracy		±1 RPM
Hysteresis		NA
Power on delay	s	<5
Trip time delay	s	Programmable (0 - 99.9sec)
<b>Indications</b>		
Under / Over / Dual speed		Y
Over Temperature		NA
Sensor detection		N
Display		7 Segment LED for Speed display & LED's for Relay indication
Reset		Auto / Manual

Parameters	Units	
<b>Output</b>		
Contact configuration		2 X 1CO (Relay 1 for speed exceedance and relay 2 for under speed)
Mechanical life (operating cycles)		5 X 10 <sup>6</sup>
Electrical Life (operating cycles) (AC15: 250V/2A @ 900 op/hr)		50,000
Max current (Ith)	A	5
Contact @ AC 15, 250VAC	A	2
Contact @ AC 12, 250VAC	A	5
SCPD	A	6A gG HRC Fuse
<b>Terminal Connections</b>		
Screw tightening torque	Nm	0.5
Conductor cross section (Solid)	mm <sup>2</sup>	1x (0.75 to 2.5) 2x 0.5 to 2x 1.5
Conductor cross section (stranded with end sleeve)	mm <sup>2</sup>	1x (0.5 to 2.5) 2x (0.5 to 1.5)
Screw		M3
<b>Dimensions</b>		
Width	mm	70
Depth	mm	90
Height	mm	62
Net Weight	gms	193
Mounting		35mm DIN rail
Orientation		any
<b>Accessories (in packing)</b>		NA
<b>Markings &amp; Standards</b>		
CE & RoHS		Yes
Standard Compliance		IEC 60947-5-1

# Water Level Controller Relay



7UG0 monitoring relays can also be used for monitoring of level of liquids (conductive liquids eg. water). This relay can be used for dual as well as single function of draining / filling of the tank. Relay can automatically sense resistance of conductive liquids upto 500kΩ. Refer below table for resistance of various liquids:

Product	kΩ
Buttermilk	1
Fruit juice	1
Vegetable juice	1
Milk	1
Soup	2.2
Beer	2.2
Coffee	2.2
Ink	2.2
Saltwater	2.2
Wine	2.2
Natural water	5
Wastewater	5

Product	kΩ
Starch solution	5
Oil	10
Condensed water	18
Soap foam	18
Jams	45
Jellies	45
Sugar solution	90
Whisky	220
Distilled water	450

## Applications

- Level monitoring of water tanks
  - Waste water treatment plant
  - Agriculture irrigation tanks
  - Monitoring of liquid levels (conductive)
- Many other applications.....



Parameters	Units	
<b>Product type</b>		Water Level ControllerRelay
<b>MLFB</b>		7UG0885-1JU20
<b>Main Circuit</b>		
Rated Insulation Voltage [Ui]	V AC	300
Rated Control supply (Aux. voltage) Uc	V	110 - 240 AC / DC
Tolerance on Control Supply		0.85x Uc...1.1x Uc
Rated Impulse Withstand Voltage [Uimp] (For Overvoltage Category II)	kV	2.5
Rated Frequency	Hz	50/60
Humidity (non-condensing)	% RH	95
Pollution Degree For PCB For Product		2 3
Max. Power consumption	VA	3
Ambient temperature (Operational)	° C	0 to 50 (for controller and sensor)
Ambient temperature (storage)	° C	-20 to +70 (for controller and sensor)
Degree of protection of Device		IP20 (Control unit)
<b>Function</b>		
Types / Modes		Delivery, Suction & Dual tank mode (Suitable for 3x / 6x sensor input).
Features		<ul style="list-style-type: none"> <li>• Auto Liquid sensitivity adjustment from (0 - 500k) ohms</li> <li>• Water level detection and indication</li> <li>• Pump protection from Dry run and Overflow condition</li> <li>• Manual Start: If Lower tank (Suction) water level is higher than low level &amp; Upper tank (Delivery) water level is below high level then by pressing 'START' key, motor can be switched ON manually</li> <li>• Alarm: Alarm function for Single tank mode (Low level detection in case of Suction mode &amp; High level detection in case of Delivery mode, No alarm when in Dual tank mode)</li> </ul>
<b>Response &amp; Delays</b>		
Response time	mS	<100
Recovery time		Instantaneous (when liquid is below bottom level sensor)
Power on delay	s	<3
Trip time delay	s	2 (Fixed)
Indications (LED)		4 numbers
Mode selection / Liquid Level detection		<ul style="list-style-type: none"> <li>- 1 LED for Suction &amp; 1 LED for Delivery</li> <li>- LED steady: all sensors in conduction,</li> <li>- LED slow blinking: reference &amp; intermediate sensor immersed</li> <li>- LED fast blinking: only reference sensor is immersed</li> </ul>
Power ON / Module healthy		1 LED
Relay output		1 LED
Reset		Auto / Manual

Parameters	Units	
<b>Output</b>		
Mechanical life (operating cycle)		5 X 10 <sup>6</sup>
Electrical Life (operating cycle) AC15: 250V/2A @ 900 op/hr		50,000
Contact configuration		1NO + 1NO Dedicated for alarm in single tank mode
Max current (Ith)	A	5
Contact @ AC 15, 250VAC	A	2
Contact @ AC 12, 250VAC	A	5
SCPD	A	6A gG HRC Fuse
<b>Terminal Connections</b>		
Screw tightening torque	Nm	0.5
Conductor cross section (Solid)	mm <sup>2</sup>	1x (0.75 to 2.5) 2x 0.5 to 2x 1.5
Conductor cross section (stranded with end sleeve)	mm <sup>2</sup>	1x (0.5 to 2.5) 2x (0.5 to 1.5)
Screw		M3
<b>Dimensions</b>		
Width	mm	35
Depth	mm	60
Height	mm	90
Net Weight	gms	110 (1x Control Unit) 22 (1x Sensor)
Mounting		35mm DIN rail
Orientation		any
<b>Sensor information (accessory)</b>		
Compatible Sensor type		7UG0985-0YY00
Sensor details		Conductive sensor probes: Stainless Steel
Sensor Voltage & Current		5V,50Hz, < 500μA
Packing (in separate packing)		3 in 1 packing
<b>Markings &amp; Standards</b>		
CE, RoHS		Yes
Standard Compliance		IEC 60947-5-1

## Selection and Ordering Data: Monitoring Relays



7UG0 712...



7UG0 753...



7UG0 84...



7UG0 99...



7UG0 48...

Type	Description	Contacts	Supply voltage	Width mm	MLFB
Line monitoring Relay	Line monitoring relay, 3Ø-3W	1 CO	Self Powered	17.5	7UG0 712-1AA20
	Digital Line monitoring relay, 3Ø-3W, 3Ø-4W	2 CO	Self Powered	35	7UG0 818-1CA20
Voltage monitoring Relay	Voltage monitoring relay, 3Ø-3W	1 CO	Self Powered	17.5	7UG0 753-1AA20
Current monitoring Relay	Digital Current monitoring, 1Ø-2W	1 CO	110V AC	35	7UG0 821-1AB20
	Digital Current monitoring, 1Ø-2W	1 CO	230V AC	35	7UG0 822-1AD20
	Digital Current monitoring, 1Ø-2W, 3Ø-3W, 3Ø-4W	1 CO	110V AC	35	7UG0 831-1AB20
	Digital Current monitoring, 1Ø-2W, 3Ø-3W, 3Ø-3W	1 CO	230V AC	35	7UG0 832-1AD20
Earth Leakage Relay	Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W,3Ø-4W	2 CO	110V AC	35	7UG0 841-1CB20
	Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W,3Ø-4W	2 CO	230V AC	35	7UG0 842-1CD20
CBCT for Earth leakage relay	Core Balance CT 35 mm				7UG0 996
	Core Balance CT 70 mm				7UG0 997
	Core Balance CT 120 mm				7UG0 999
	Core Balance CT 210 mm				7UG0 994
	Core Balance CT 310 mm				7UG0 995
Temperature controlling relay	Temperature controller with PID/ON-OFF Control suitable for TC / RTD inputs	2 NO + SSR output	85 - 270 V AC/DC	48	7UG0 480-1IU20
Earth fault monitoring relay	Digital earth fault monitoring relay 1Ø-2W, 3Ø-3W, 3Ø-4W	2 CO	85 - 270 V AC/DC	35	7UG0 861-1BU20
CBCT for earth fault monitoring relay *	Core Balance CT 160A	3P			7UG0 9910
		4P			7UG0 9911
	Core Balance CT 250A	3P			7UG0 9912
		4P			7UG0 9913
	Core Balance CT 630A	3P			7UG0 9914
		4P			7UG0 9915
Thermistor motor protection relay <span>New</span>	Thermistor motor protection relay for PTC type thermistor	2 CO	110 - 240 V AC/DC	35	7UG0881-1BU20
Speed monitoring relay <span>New</span>	Speed monitoring relay	2 X 1CO	110 - 240 V AC/DC	70	7UG0583-1CU20
Water level controller relay <span>New</span>	Water level controller relay	2 X 1NO	110 - 240 V AC/DC	35	7UG0885-1JU20
Sensor for water level controller relay <span>New</span>	Conductive sensor probe set of 3 probes				7UG0985-0YY00

\* CBCT for Earth fault monitoring relay will be rectangular in dimension

# 7PV0 Timing Relays:

Siemens offers 7PV0 electronic timers which meet the various control timing requirements of the industry. These timers comply with IEC 61812-1 & IEC 60947-5-1

## Range:

**ON delay:** 06 different ranges - selectable

### Control supply voltage options-

- Fixed 240 V AC

### Time ranges –

- 0.1sec - 3 hrs

### LED display



## Multifunction: 10 functions

(ON delay, delay with totalise, single shot, delay on break, interval, interval with totalise, interval after break, cyclic equal off first, cyclic equal on first, Pulse output)

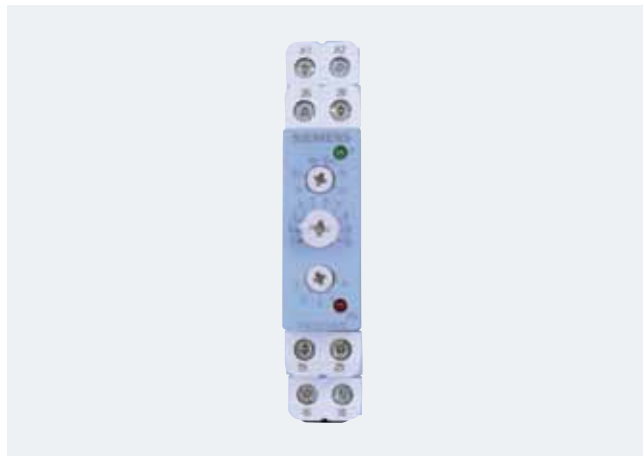
### Control supply voltage options-

- Universal voltage 24V - 240V AC  
12V - 240V DC

### Time ranges –

- 0.1sec - 20 hrs

### LED display



## Multifunction: 15 functions

(On delay (A), Interval (B), Asymmetrical cyclic OFF first (C), Asymmetrical cyclic ON first (D), Cyclic equal OFF first (E), Cyclic equal ON first (F), Pulse output (H), Delay on break (J), Delay on make / break (K), Interval after break (L), Single shot (P), Retrigger able Single shot (Q), Latching relay (R), Delay with Totalize (t), Interval with Totalize (U))

### Control supply voltage options-

- Universal voltage 20 to 240V AC/DC

### Time ranges –

- 0.1sec - 999 hrs

### LCD display



### Benefits:

- Space saving due to narrow width of 17.5mm
- High accuracy: Repeat accuracy < 1% & Setting accuracy < 5%
- Clear visual status indication through 2 separate LEDs both for actuation of control supply and the change over status
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Wide sensing range
- RoHS compliant



### Standards and approbations:

- The 7PV0 range conforms to IEC 61812-1 & IEC 60947-5-1

### Applications:

- 7PV0 electronic timers can be used for all delayed switching applications in control, starting and protection circuits. They are ideal for use in application like machine tools, material handling, process control and motor control.



## Timing Relays: Technical data

			On delay	Multi-function (10 functions)	Multi-function (15 functions)
			7PV0712-1AD20	7PV0723-1AZ20	7PV0732-1AV20
Main Circuit	Rated Insulation Voltage [Ui]	Ui (V) AC	300		
	Control voltage (Aux. voltage)	V	240V AC	12-240V DC / 24-240V AC	20--240V AC/DC
	Control voltage tolerance		-15% to +10%	-15% to +10%	-15% to +10%
	Impulse test Voltage [Uimp] (For Overvoltage Category II)	KV	2.92		
	Rated Frequency	Hz	50/60		
	Dielectric test Voltage	KV	1.44		
	Pollution Degree For PCB For Product		2 3		
Response	Setting accuracy	%	±5% of full scale	±5% of full scale	± 0.5% of set time
	Repeat accuracy	%	±0.5%	±0.5%	± 0.1 %
	Recovery time	ms	<100	100	<100
	Power consumption	VA	4VA	3.2VA max	4VA
Endurance	Mech endurance operating cycles	(mio)	10	5	10
	Elect endurance AC15: 3A @ 250V AC (900 ops./hr)	(mio)	0.1	0.07	0.1
	Ambient temperature (Operational)	° C	0 to 50	0 to 50	0 to 50
	Ambient temperature (storage)	° C	-20 to +70	-20 to +70	-20 to +70
	Relative Humidity		25% to 75%		
	Screw tightening torque	Nm	0.6	0.6	0.6
	Conductor cross section (Solid)	Sq mm	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2 x 0.5 to 2x 1.5
	Conductor cross section fine stranded with end sleeves	Sq mm Sq mm	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)	2 x (0.5 to 1.5) 1 x (0.5 to 2.5)
	Degree of protection of device		IP20		
Timing	Trip time setting	s	0.1 sec to 3 hrs (06 time ranges)	0.1--1s 1---10s 6---60s 1---10min 6---60 min 1---10hr 2---20hr	0.1 sec to 999 hrs
Function	10 modes		On delay	On delay (A) Delay with totalise (At) Single Shot (B) Delay on Break (C) Cyclic equal off first (with external contact) (D) Cyclic equal on first (Di) Interval (H) Interval with Totalise (Ht) Pulse output (Pe) Interval after break (W)	15 functions On delay (A) Interval (B) Asymmetrical cyclic OFF first (C) Asymmetrical cyclic ON first (D) Cyclic equal OFF first (E) Cyclic equal ON first (F) Pulse output (H) Delay on break (J) Delay on make / break (K) Interval after break (L) Single Shot (P) Retriggerable Single Shot (Q) Latching Relay (R) Delay on break with Totalise (T) Interval with Totalise (U)

			On delay	Multi-function (10 functions)	Multi-function (15 functions)
Output	Max current (Ith)		5A		
	Contacts @ AC 15, 250VAC	1C/O	3A / 250V	3A / 250V	3A / 250V
	Contact s @ AC 15, 250VAC	2x 1C/O			
	Contacts @ AC 12, 250VAC	1C/O	5A / 250V	5A / 250V	5A / 250V
	Contact s @ AC 12, 250VAC	2x 1C/O			
	Pause time				
	Terminal Connections				
	Screw		M3		
	Spring			NA	
	Display		Red LED:Power ON, Green LED:Rel ON	1 Relay LED 1 Timer ON LED	LCD
Dimensions	Width	mm	17.5	17.5	17.5
	Depth	mm	60	60	60
	Height	mm	90	90	90
	Weight	g	61	68	69
	Mounting		35mm DIN rail		
	Orientation		any		
EMC Compliance	Table 17- Immunity tests for industrial environments of IEC 61812-1.				
Certificates	CE		Y		
	Standard Compliance		IEC 61812-1 & IEC 60947-5-1		

## Selection and ordering data: Timing relays



7PV0 712...



7PV0 723...

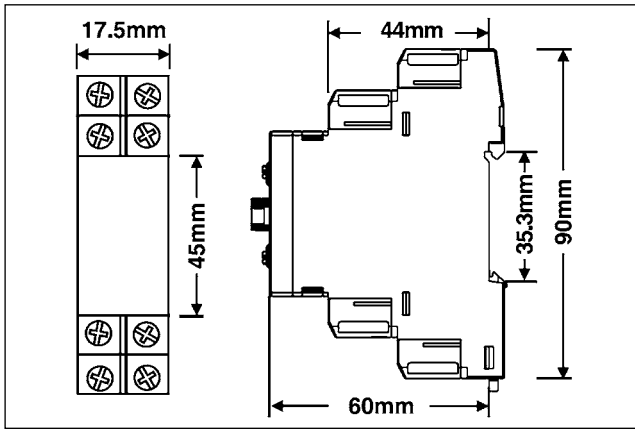


7PV0 732...

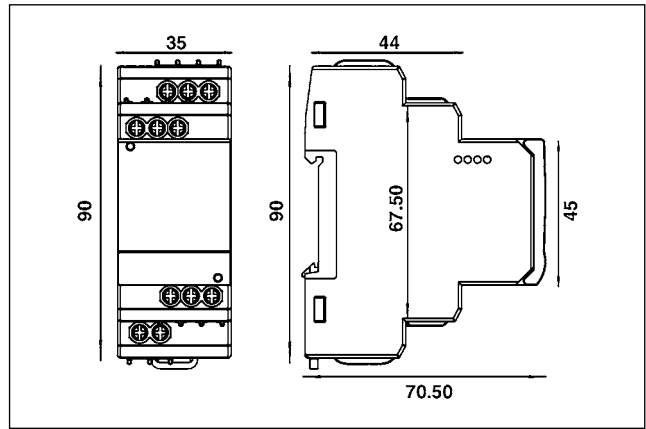
Timer	Description	Contacts	Supply Voltage	Width mm	MLFB
<b>ON Delay</b>	ON Delay, 06 Time Ranges	1 C/O	240V AC	17.5	7PV0 712-1AD20
<b>Multifunction</b>	Multifunction – 10 Functions	1 C/O	12 - 240V DC 24 - 240V AC		7PV0723-1AZ20
	Multifunction – 15 Functions, 8 Time Ranges	1 C/O	20 - 240V AC / DC		7PV0 732-1AV20

## Dimensional drawings: Monitoring relays

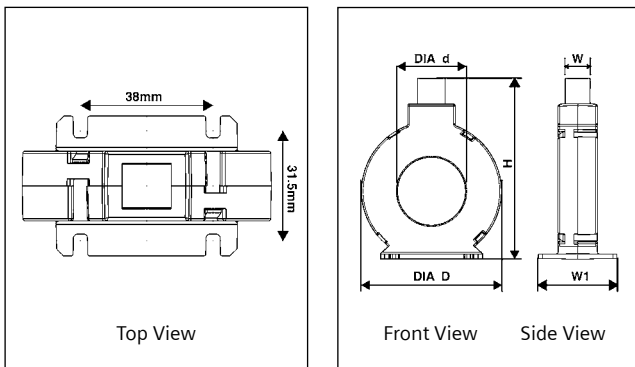
7UG0 7...



7UG0 8...

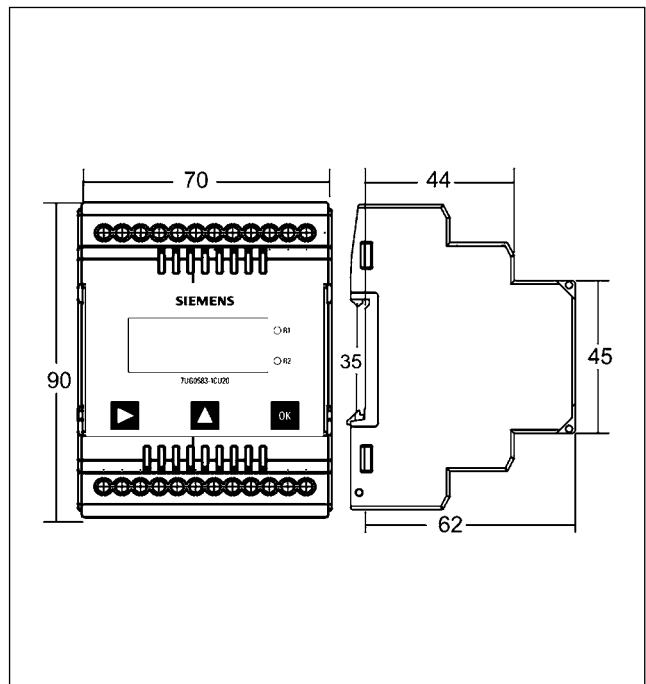


7UG0 9... (ELR CBCT)



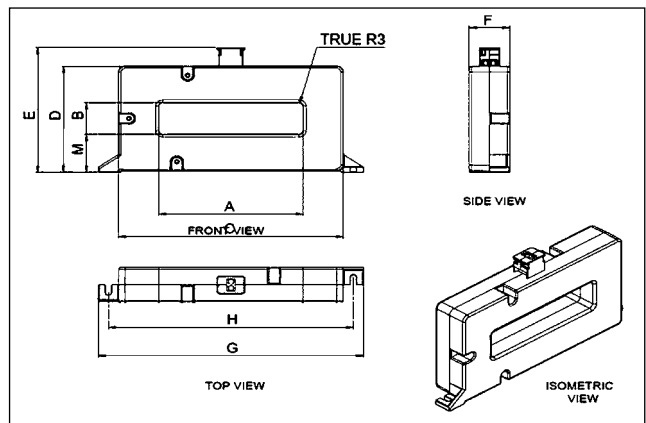
CBCT TYPE	Dimensions (mm)				
	D	d	H	W	W1
7UG0996	70	35	96	10	40
7UG0997	107	70	131	10	40
7UG0999	157	120	184	10	40
7UG0994	268	210	270	-	55
7UG0995	377	310	380	-	65
STD.TOL.	2 - 3	5 - 6	-	1.5 - 2	-

7UG0 5...



7UG0 9... (EFR CBCT)

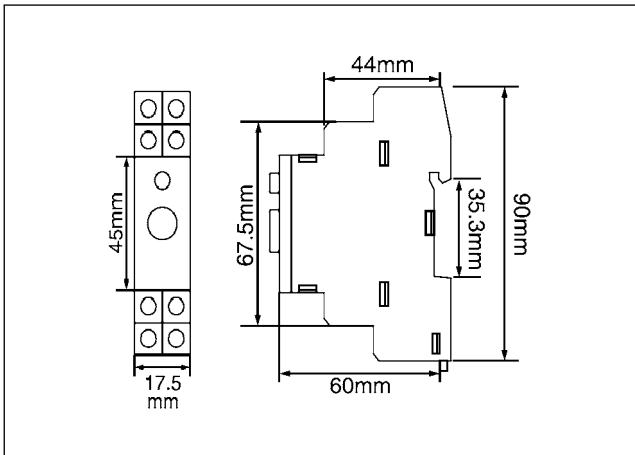
Product	Dimensions (mm)								
	A	B	C	D	E	F	G	H	M
7UG09910	100	25	156	84	100	28	184	170	30
7UG09911	140	35	201	98	114	28	230	215	32
7UG09912									
7UG09913	180	35	236	93	109	28	264	250	30
7UG09914									
7UG09915	220	50	276	112	128	28	305	290	32



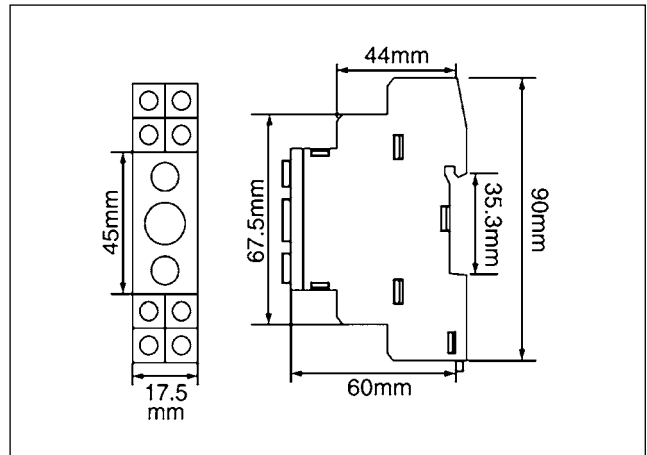


## Dimensional drawings: Timing relays

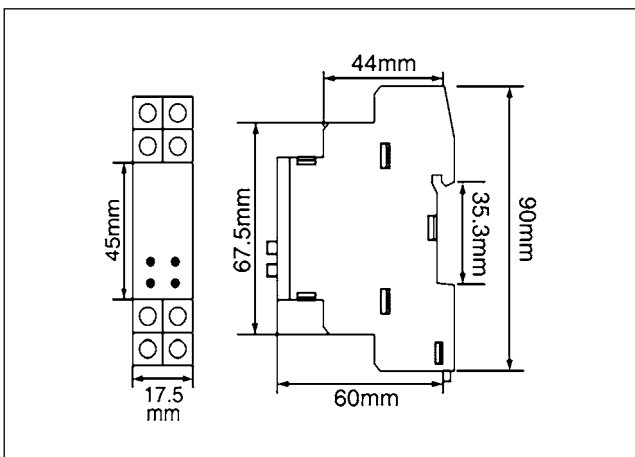
7PV0 712...



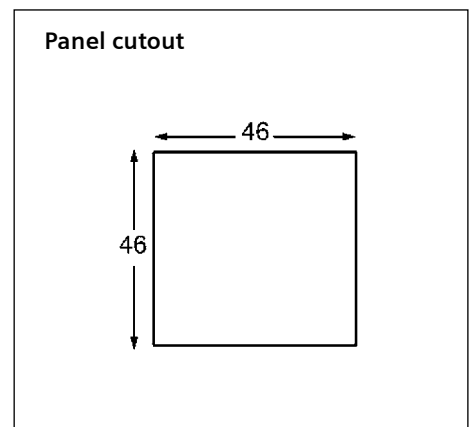
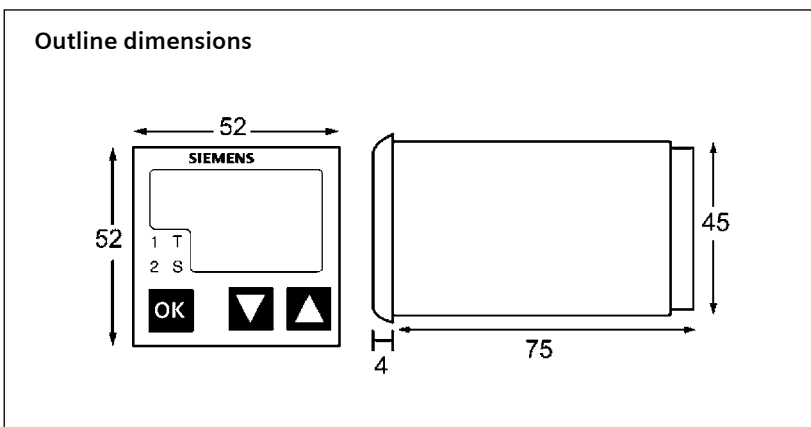
7PV0 723...



7PV0 732...

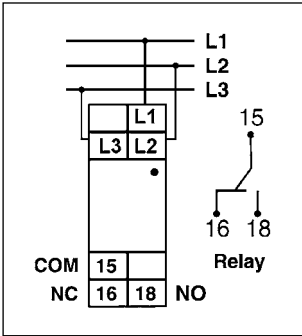


## Dimensional drawings: Temperature controller relay

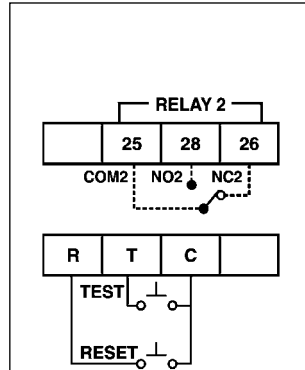


## Terminal Connections:

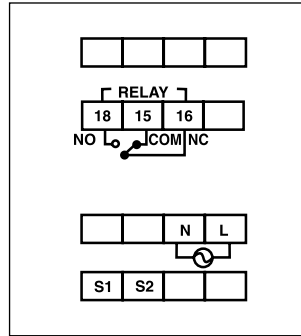
7UG0 71, 7UG0 75...



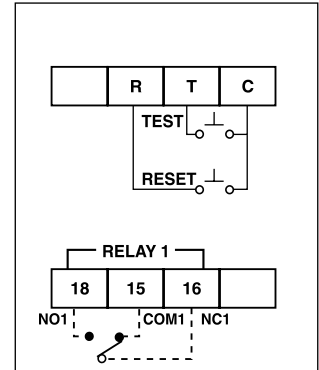
7UG0 84...



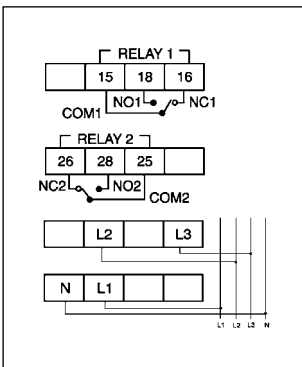
7UG0 82



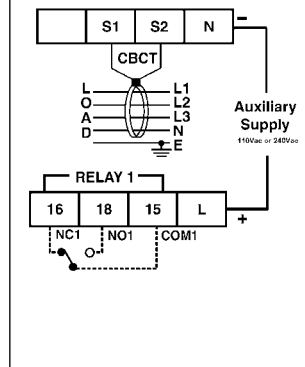
7UG0 86...



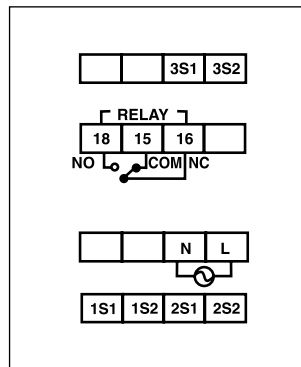
7UG0 818...



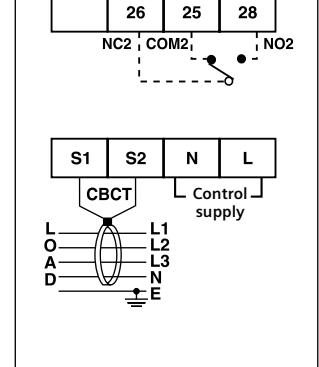
7UG0 83



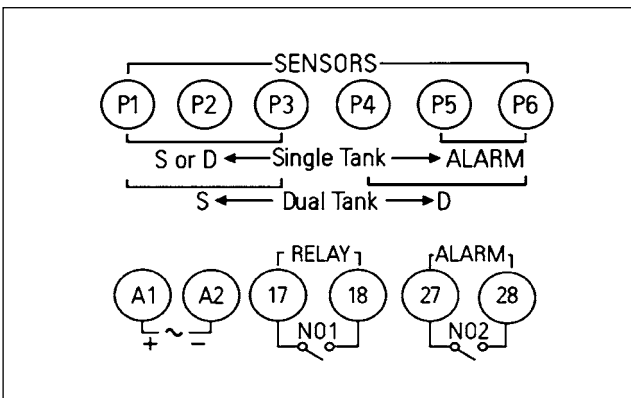
7UG0 83



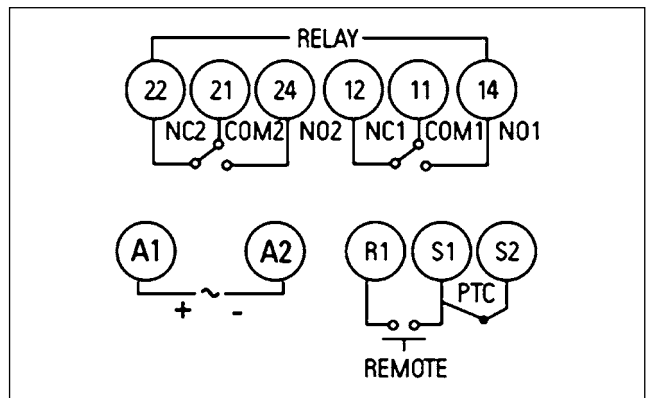
7UG0 83



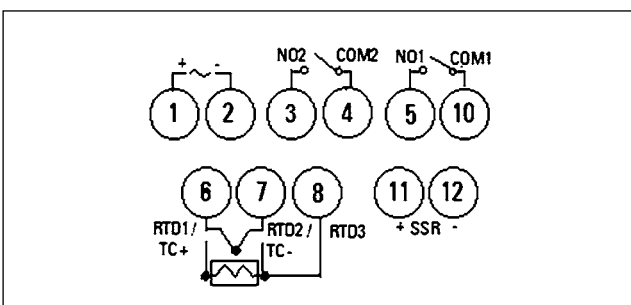
7UG0 885...



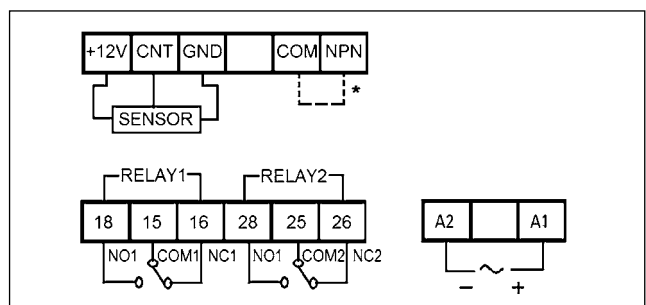
7UG0 881...



7UG0 48...

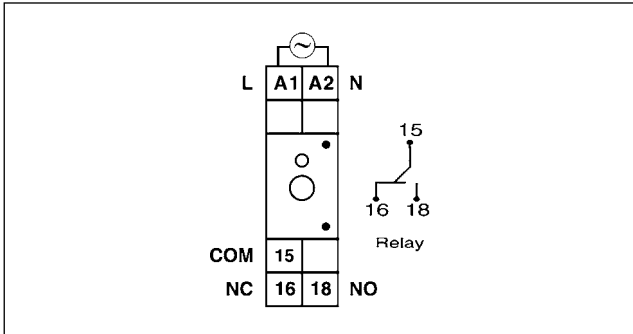


7UG0 58...

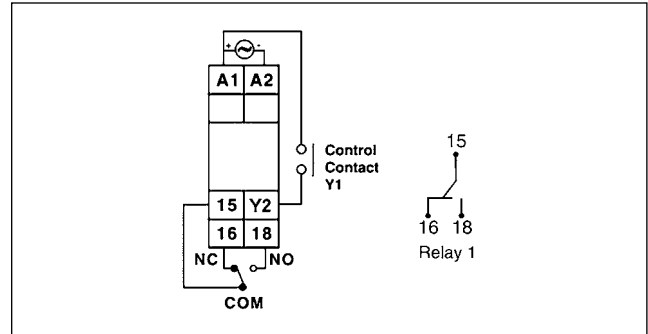


## Terminal Connections:

7PV0 712...



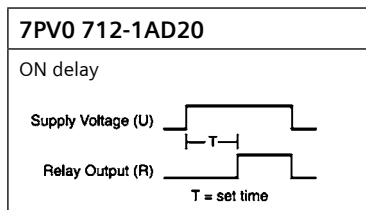
7PV0 723... / 7PV0732...



## Timing diagram:

7PV0732 (Digital 15 func) / 7PV0723 (10 func)			
A. ON delay 	B/H. Interval 	T. Delay on break with Totalise At. Delay with totalise 	J/C. Delay on Break 
P/B. Single Shot 	U/Ht. Interval with Totalise 	L/W. Interval after Break 	D. Cyclic equal off first (with external contact) 
F/Di. Cycle equal (ON 1st) 	Pe. Pulse output # 	H. Pulse output* 	C. Asym. cyclic (OFF 1st)* 
D. Asym. cyclic (ON 1st)* 	E. Cycle Equal (OFF 1st)* 	K. Delay on Make/Break* 	Q. Retriggerable Single shot* 
R. Latching Relay* 			

t or T = set time delay, t1 = off time, t2 = on time, # only for 7PV0723, \* only for 7PV0732



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