# **SIEMENS**



# Smart. Easy. Reliable.

Monitoring Relay 7UG0 and Timers 7PV0

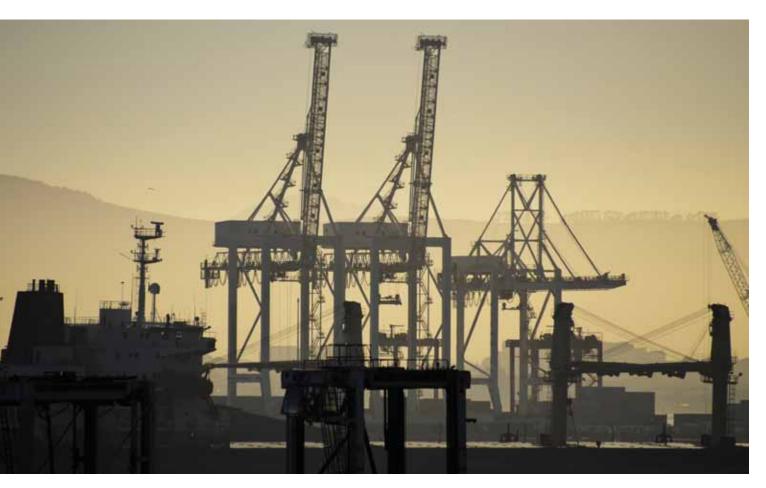
# Smart. Easy. Reliable.

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
- Residual current monitoring relays
- Current monitoring relays
- Earth fault monitoring relays

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
Line	7UG0 712	3Ø 3W	✓	✓	✓								
monitoring relay	7UG0 818	3Ø 3W / 3Ø 4W	✓	✓	✓	✓	✓	✓	✓				
Voltage Monitoring relay	7UG0 753	3Ø 3W	✓		✓	✓	✓						
Current	7UG0 82	1Ø 2W	✓	✓							✓	✓	
monitoring relay	7UG0 83	1Ø 2W / 3Ø 3W / 3Ø 4W	✓	✓							✓	✓	
Earth leakage relay	7UG0 84	1Ø 2W / 3Ø 3W / 3Ø 4W								✓			
Earth fault monitoring relay New	7UG0 86	1Ø 2W / 3Ø 3W / 3Ø 4W											✓

#### **Features:**

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

#### **Benefits:**

- Wide sensing range leads to fewer variants Optimized inventories
- Durable and maintenance free product
- DIN rail mounting Quick & Easy Installation
- Entire range is covered in only two sizes giving uniformity and better aesthetics
- Reliable protection from voltage and leakage current
- RoHS compliant RoHS









#### Standards and approbations:

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

They also carry **( f** 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 *I* 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:

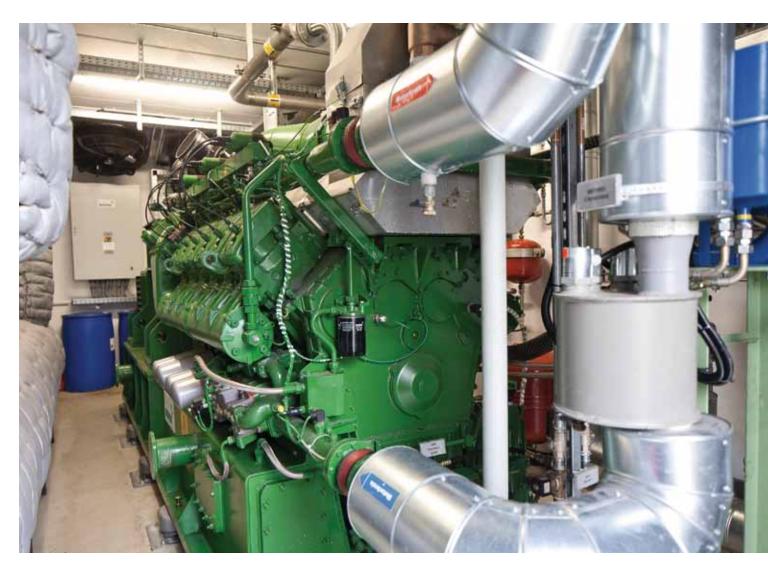
Voltage monitoring relays are suitable for monitoring of balanced or unbalanced 3phase 3wire supplies. These relays find applications where, even a dip or a long surge in the system is harmful and can damage the equipment associated to it. These relays can be used in all electrical systems for e.g. loads 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 a 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	Current	Earth Leakage	Earth fault
					monitoring relay	monitoring relay	monitoring relay	monitoring relay
			7UG0712-1AA20	7UG0818-1CA20		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%	85270AC/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					
Current/ Voltage	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	01.19 kA	4mA - 30A	1A630A
Range	Setting range	V/A	fixed	280 - 500 V AC (L-L) 160 - 288 V AC (L-N)	310 - 480 V AC	Pri: 1A999A 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	< l = 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 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					

					Voltage	Comment	Foutle Looks and	Family Carolis
			Line mo	nitoring relay	monitoring	Current monitoring relay	Earth Leakage monitoring relay	Earth fault monitoring relay
Network	Protection (AC	1Ø -	_	-	relay –	$\sqrt{}$	$\sqrt{}$	√
	network)	2W 3Ø,	$\sqrt{}$	√selectable	V	V	$\sqrt{}$	$\sqrt{}$
		3W,	V	v selectable	V	V	V	v
		3Ø, 4W		√selectable		$\sqrt{}$	$\sqrt{}$	$\sqrt{}$
Features	Pre-warning	Α				-	Y(50-100%)	Yes (50-100%)
	CBCT error Earth Leakage /	A A				_	√ 10mA30A	10% to 80% of
	Fault trip setting	^					TOTILASUA	FLC
	Phase failure	V	√	√	√	-	-	-
	Phase reversal	V	√ 	√ 5. 00.0%	√	_ √	-	-
	Phase imbalance / Current Assymetry	V/I	30V fixed	5 - 99.9%	-	V		
	Under voltage/ Under current protection	V/A		280-500 V <sub>L-L for 3Ø, 3W</sub> 160-288 V <sub>L-N for 3Ø, 4W</sub>		0999A		
	Over voltage/ Over current protection	V/A		280-500 V <sub>L-L for 3Ø, 3W</sub> 160-288 V <sub>I-N for 3Ø, 4W</sub>	425 - 480V	0.5A1.19KA		
	Under freq	Hz		45 - 65		-		
	Over freq protection	Hz		45 - 65		-		
Reset	Auto/ Manual / Remote		A	A/M	Α	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	0.199.9A	5 - 40 % of set value	1 to 10% of Fault current setting
	Power on delay	s	200 ms	2 - 99.9s	400ms	0.599.9s	0.5 - 99.9s	0.599.9s
	Trip time delay	S	Fixed	0 - 99.9s	0.2 - 10	099.9s	0 - 99.9s	099.9s
	Recovery time setting	S		0 - 99.9s		099.9s	0 - 99.9s	099.9s
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		5A / 250V		5A / 250V	5A / 250V		
	Contact s @ AC 12, 250VAC	2x 1C/O		5A / 250V			5A / 250V	5A / 250V
	Terminal		Screw					
	Connections		Crass LED and	"ON" LED: Power ON	Crass LED and	LED "ON". Davies	"ON" I ED. Davier	LCD with
	Display		Green LED on: Power ON Green LED off: Fault indication	"R1" LED: Fower ON "R1" LED: Fault in Relay 1 "R2" LED: Fault in Relay 2 LCD: Parameters & Fault type	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	Backlight
Dimensions		mm	17.5	35	17.5	35	35	35
	Depth	mm	60	70.5	60	71	70.5	70.5
	Height Weight	mm q	90 62	90 135	90 62	90 135	90 207	90 207
	Mounting	9	35mm DIN rail	,55	<b>52</b>	155	207	207
	Orientation		any					
Accessories			-	-	-	Aditional 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
	Compliance						ILC 00547-3-1	ILC 00347-3-1

## Selection and Ordering Data: Monitoring Relays











7UG0 712... 7UG0 818... 7UG0 753... 7UG0 84... 7UG0 99...

Ту	pe	Description	Contacts	Supply voltage	Width mm	Siemens MLFB
Line monitoring relay		Line monitoring relay, 3Ø-3W	1 C/O	Self powered	17.5	7UG0 712-1AA20
		Digital Line monitoring relay, 3Ø-3W, 3Ø-4W	2 C/O	Self powered	35	7UG0 818-1CA20
Voltage Mon	itoring relay	Voltage monitoring relay, 3Ø-3W	1 C/O	Self powered	17.5	7UG0 753-1AA20
Current Mon	itoring relay	Digital Current monitoring 1Ø-2W	1 C/O	110 V AC	35	7UG0 821-1AB20
		Digital Current monitoring 1Ø-2W	1 C/O	230 V AC	35	7UG0 822-1AD20
		Digital Current monitoring 1Ø-2W, 3Ø-3W, 3Ø-4W	1 C/O	110 V AC	35	7UG0 8311-AB20
		Digital Current monitoring 1Ø-2W, 3Ø-3W, 3Ø-4W	1 C/O	230 V AC	35	7UG0 832-1AD20
Earth leakage relay		Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W, 3Ø-4W	2 C/O	110 V AC	35	7UG0 841-1CB20
		Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W, 3Ø-4W	2 C/O	230 V AC	35	7UG0 842-1CD20
CBCT for Eart	h leakage	Core Balance CT 35mm				7UG0 9-96
relay		Core Balance CT 70mm				7UG0 9-97
		Core Balance CT 120mm				7UG0 9-99
Earth fault m	onitoring	Digital earth fault monitoring relay 10-2W, 30-3W, 30-4W	2 C/O	85 - 270 V AC/DC	35	7UG0 861-1BU20
CBCT for	3P	Core Balance CT 160A				7UG0 9910
Earth Fault monitoring	4P					7UG0 9911
relay*	3P	Core Balance CT 250A				7UG0 9912
	4P					7UG0 9913
	3P	Core Balance CT 630A				7UG0 9914
	4P					7UG0 9915

 $<sup>\</sup>mbox{{\for Earth Fault monitoring relay will be rectangular in dimension.}}$ 

## **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)

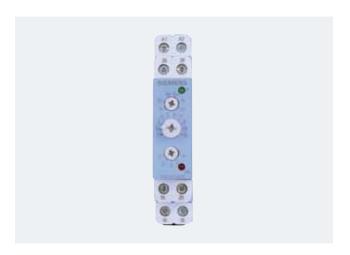
#### Control supply voltage options-

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%</li>
- 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:**

7PVO 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	20240V AC/DC
	Control voltage tolerance		-15% to +10%	-15% to +10%	-15% to +10%
	Rated Impulse Withstand Voltage [Uimp] (For Overvoltage Category II)	KV	2.5		
	Rated Frequency	Hz	50/60		
	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
	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)	0.11s 110s 660s 110min 660 min 110hr 220hr	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					
Certificates	CE		Υ					
	Standard Compliance		IEC 61812-1 & IEC 60947-5-1					

## Selection and ordering data: Timing relays







7PV0 712...

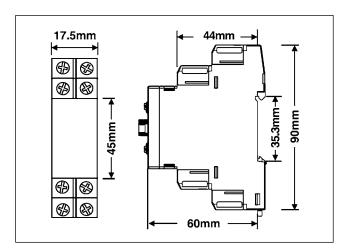
7PV0 723...

7PV0 732...

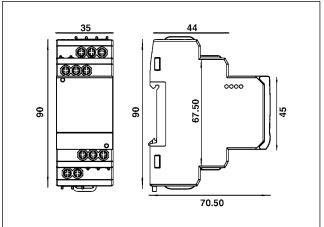
Timer	Description	Contacts	Supply Voltage	Width mm	MLFB
ON Delay	ON Delay, 06 Time Ranges	1 C/O	240V AC		7PV0 712-1AD20
Multifunction	Multifunction – 10 Functions	1 C/O	12 - 240V DC 24 - 240V AC	17.5	7PV0723-1AZ20
	Multifunction – 15 Functions, 8 Time Ranges	1 C/O	20 - 240V AC / DC		7PV0 732-1AV20

### **Dimensional drawings: Monitoring relays**

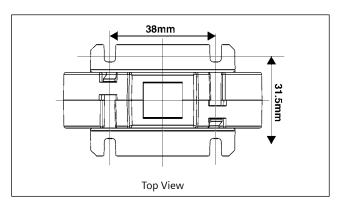
#### 7UG0 7...



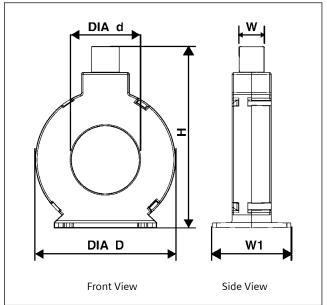
#### 7UG0 8...



#### 7UG0 9... (ELR CBCT)

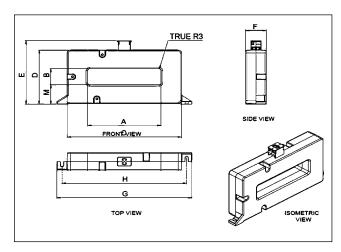


CBCT TYPE	Dimensions (mm)								
CBCITTFE	D	d	Н	W	W1				
7UG0996	70	35	96	10	40				
7UG0997	107	70	131	10	40				
7UG0999	157	120	184	10	40				
STD.TOL.	2 - 3	5 - 6	-	1.5 - 2	-				



#### 7UG0 9... (EFR CBCT)

Product		Dimensions (mm)										
Floudet	Α	В	С	D	E	F	G	Н	М			
7UG09910	100	25	156	84	100	28	184	170	30			
7UG09911	140	140	35	201	98	114	28	230	215	32		
7UG09912		33	201	90	117	20	230	213	32			
7UG09913	100	35	236	93	109	28	264	250	30			
7UG09914	180	33	5 236	93	109	28	204	250	30			
7UG09915	220	50	276	112	128	28	305	290	32			

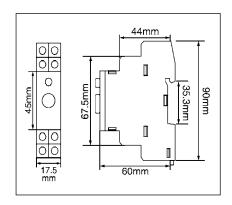


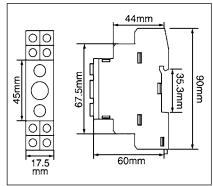
#### **Dimensional drawings: Timing relays**

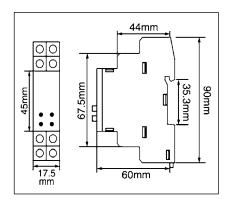
7PV0 712...

7PV0 723...

7PV0 732...







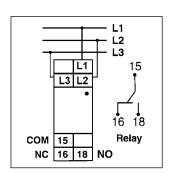
#### **Terminal Connections:**

7UG0 71, 7UG0 75...

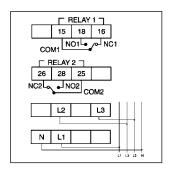
7UG0 84...

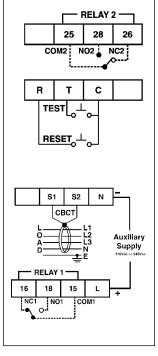
7UG0 82

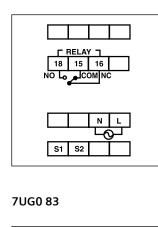
7UG0 86...

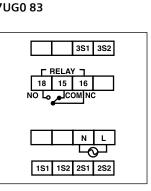


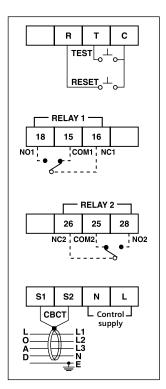
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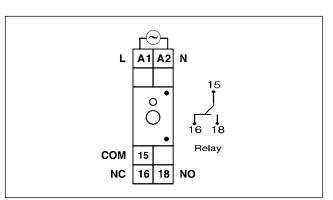




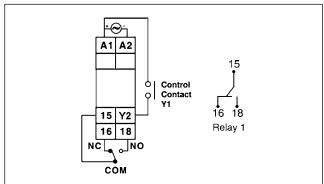




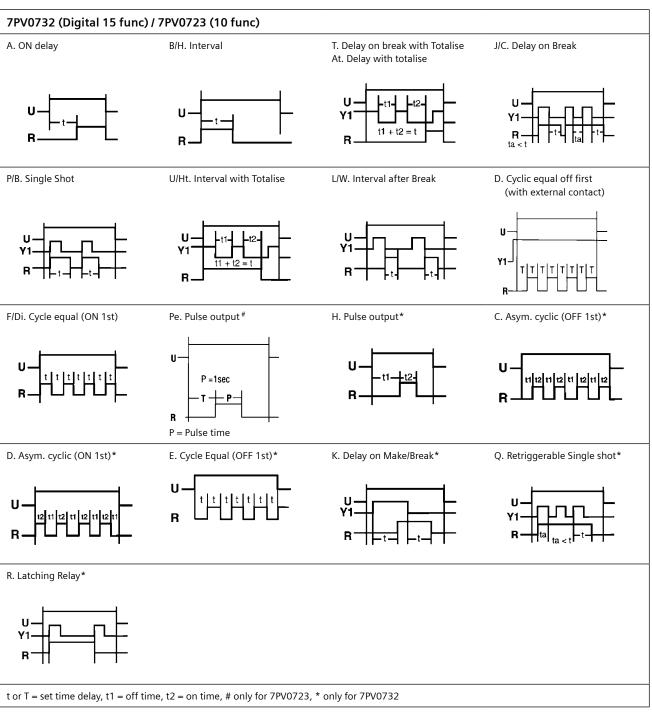
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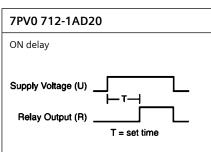


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Fax:+91 79 30927699

Baroda Ground Floor, Urja Bhavan Opp.Makarpura Railway Station Maneja

Vadodara - 390 013 ☎ : +91 265 3957701 Fax: +91 265 3039190

Bengaluru 1st Floor, Jyoti Mahal No. 49, St. Marks Road Bengaluru - 560 001 ☎: +91 80 33422000 Fax: +91 80 33424131

Chandigarh SCO 188/191, 3rd Floor, Sector-17 C Chandigarh - 160 017 \$\frac{a}{2}: +91 172 4690300 Fax: +91 172 4690399

Chennai 4th Floor, ETA Mount Central Seethakathi Business Centre, Mount Road Chennai - 600006 ©: +911 44 30474000 Fax: +914 44 30474080

Coimbatore
1st Floor, "Senthil Towers"
1078, Avinashi Road
Coimbatore - 641018
2: +91 422 3076300
Fax: +91 422 3076310

Gurgaon
Plot No-78, Tower −B
Jagatjit Industries Building (JIL)
Opposite SBI Academy, Sector-18
Gurgaon - 122015

2: +91 124 2842000, 3810200

Hyderabad 5-9-19, 4th & 5th Floor Laxmi Narasinh Estate Opp. Secretariat Road Saifabad

Saifabad Hyderabad - 500 004 ☎: +91 40 30922500 Fax: +91 40 30923145

Jaipur 6, Park Street Opp. Pink City Petrol Pump M.I.Road Jaipur - 302 006, Rajasthan ☎ : +91 141 5152108 Fax: +91 141 2370482

Kolkata 5th Floor, Infinium Digispace CP - 15, Sector V, Salt Lake Kolkata - 700091 ☎: +91 33 30171911 Fax: +91 33 30171328

Lucknow
28/45, Ashok Marg
Opp. Indira Bhawan
Lucknow - 226001

2:+91 522 4031022, 4031000
Fax: +91 522 4031019

Mumbai Business Centre-1 Thane Belapur Road Thane - 400 601 ☎: +91 22 39663000 Fax: +91 22 39663721

Nagpur 5th Floor, Land Mark Building Wardha Road, Ramdas Peth Nagpur - 440 010 ☎:+91 712 3093000 Fax: +91 712 3093111

Pune
Tower B/701-705, ICC Trade Tower
403A, Senapati Bapat Road
Pune - 411016

2:+91 20 30466000
Fax:+91 20 30466060

Vishakhapatnam 2nd Floor, 30-8-47 Lakshmi Narasimha Towers Banu Street, Daba Gardens Visakhapatnam - 530 020 Andhra Pradesh

☎: +91 891 3050200 Fax: +91 891 3050222

#### **Territory managers:**

Agra 31, Maitri Bagh, Dayal Bagh Agra-282005, UP Mobile: +91 7619047999 E-mail: achint.mathur@siemens.com

E-maii: actinication Angul
Plot No. 6097, 1st Floor
At-Bhandubar (Near RMC Gate)
Via - Hakimpada. P.O. - Kumanda
Dist. - Angul, Odhisa - 759143
Mobile: +91 943714662
E-mail: sudipta.garnayak@siemens.com

E-mail: Sucipia.garnayak@siemens.co Aurangabad Flat No. 603, Building A2 Disha Sanskruti Silkcity, Paithan Road Aurangabad - 431001 (MH) Mobile: +91 7720032974 E-mail: Prashant.Joshi@siemens.com

Belgaum H.No. 713, Narvekar Lane, Shahpur Belgaum - 590003, Karnataka Tel.: +91 0831 2495156 Mobile: +91 9740277991 E-mail: anand.gawade@siemens.coi

Flat No. 7, 2nd Floor, Jyotirling Plaza Congress Road, Thilakwadi Belgaum - 590011, Karnataka Mobile: +91 7259400100 E-mail: prathish.t\_m@siemens.com

E-mail: pratusing...
Bharuch
Gold B, 804, Samruddhi Residency
Opp. Zadeshwar Bus Stop, Zadeshwar Road
Bharuch - 392011
Mobile: +91 9429037805
E-mail: kalpeshkumar.darji@siemens.com

Bhilai Flat No. M-203, Rishabh City Prime Potia kala, Durg - 490 001 (CG) Mobile: +91 7869922211 E-mail: pravin.deshbhratar@siemens.com

Bhopal Flat No. 104, Sagar Home Phase-2 Sarvadharma Society, Sector A Nayapura Road, Bhopal - 462042 Madhya Pradesh Mobile: +91 9977228084 E-mail: prajwal.khapekar@siemens.com

Bhubaneswar Plot No. 1597, Infront of Fishery Lane Chintamaniswar, Bhubaneswar - 751006

Chintamaniswar, Bhubaneswar - 751006 Odisha Mobile: +91 9937063598 E-mail: sumit.sengupta@siemens.com Bhubaneswar Archid Royal Apartment, Flat No. 302 Nageswar Tangi, Bhubaneswar - 751002 Odisha Mobile: +91 9163442180 E-mail: pm.barik@siemens.com

Boisar Flat No. 101, A Wing Mahavir Shrishti Apartments Near Madhur Hotel, Navapur Road Boisar, Thane (W) - 401506 Mobile: +91 9819231892 E-mail: debashis.biswas@siemens.

Cochin K.G.Oxford Business Centre

K.G. Oxford Business Centre 3A, Shreekandath Rd, Ravipuram Cochin - 682016 Tel.: +91 4028611/22 Mobile: +91 9846006580 E-mail: girish.v\_nair@siemens.com

Cochin
K.G.Oxford Business Centre
3A, Shreekandath Rd, Ravipuram
Cochin - 682016
Mobile: +91 9526065551
E-mail: abhishek.tyagi@siemens.com

Cochin K.G.Oxford Business Centre 3A, Shreekandath Rd, Ravipuram Cochin - 682016 Mobile: +91 9744511109 E-mail: vinu.pillai@siemens.com

Dehradun 32, Dhronpuri, Main Lane G.M.S.Road, Deharadun - 248001 Uttarakhand Mobile: +91 8650404404 E-mail: shashibhushan.prasad@siemens.com

Durg Anandvihar Phase-1, Plot No. 18 Borsi South, Durg - 491001, (CG) Mobile: +91 9425016197 E-mail: jitendra.potdar@siemens.com

Durgapur Clo Anjan Sadhu 3/36, A.K. Bithi City Center, P.O. Durgapur - 713216 Nearest Landmark - Bidisha Residential Complex Mobile: +91 8334977803 E-mail: saurav.bhowmik@siemens.com

Goa
House No S-2, Classque Appartment
Porvorim, Goa - 403501
Mobile: +91 7722008113
E-mail: jithin.jacob@siemens.com

E-maii: Jitiiripatuus si Gulbarga Flat No.13, 3rd Floor, Shubha Residence Deshmukh Layout, Drajmapur, Kalaburagi Gulbarga District - 585103 Karnataka Mobile: +91 7259661717 E-mail: anirudh.ganta@siemens.com

E-mail: anirudh.ganta@siemens.cor **Guwahati** House No. 20, Ushanagar Dispur Supermarket, Guwahati Assam - 781006 Mobile: +91 9864110684 E-mail: biplab.datta@siemens.com

Hospet

Hospet Ramanand Residency, Flat No. 204 1st Main, Nehru Co-op Colony Hospet - 583203, Hospet - 583203, Karnataka Mobile: +91 9901400227 E-mail: roy.sanjib@siemens.com

Hospet # 727, Lakshmi Narasimha Nilaya Near Surbhi Kalyana Mantapa, Amaravathi Hospet - 583203 Mobile: +91 9741114877

E-mail: naveen.sn@sie

# B2, "Sunshine" 1st Floor Sipcot Housing Colony, Dharga Hosur - 635126,

Hosur - 635120, Tamilnadu Mobile: +91 9880213880 E-mail: kamalanaban.tv@siemens.com

te-mair: kamialanadan.tvesiemens.com # 21, Sri Mallikarjuna Nilaya, 1st Floor Somanagowdara Layout, Bengeri Extension Hubli - 580023, Karnataka Mobile: +91 9880003724 E-mail: kr.purushottam@siemens.com

Indore
Govind Dham, 13 Ahilyapuri
Near Residency (Llub
Indore - 452001 (MP)
Mobile: +91 9977236899
E-mail: raghvendra.bhadouria@siemens.com

Indore
C/o Dr. Mahesh Malviya, House No. 336
Scheme No. 114, Part 2
Indore - 452010, M.P.
Mobile: +91 9713013050
E-mail: rohit.seth@siemens.com

Jajpur Kirtan Enclave, Flat No. 316, C Block Chhordha Chaak, Jajpur Keonjhar Road Jajpur - 755019 (Nearest Land Mark - SBI ATM counter) Mobile: +91 9937189624 E-mail: probir.mukherjee@siemens.com

Jalandhar H.No. 140, Second Floor, Defence Colony Jalandhar, Punjab - 144001 Mobile: +91 8427979870 E-mail: himanshu.kaushik@siemens.com

Jammu
H.No. # 1A, Sector # 1 Extension
Friends Colony, Near Marble Market
Trikuta Nagar Extension, Jammu - 190012
Mobile: +91 9888851497
E-mail: chander.parkash@siemens.com

Jodhpur D-212, Near Sai Baba Mandir, Shankar Nagar Pal Road, Jodhpur - 342007 Mobile: +91 7665590333 E-mail: jain.nitin@siemens.con

Kanpur Flat No. 607, Gulmohar Garden Phase I Shastri Nagar, Kanpur - 208005, UP Mobile: +91 9839102434 E-mail: shagun.gupta@siemens.com

Khopoli Flat A 14, Dutta Krupa Housing Society Upper Khopoli, Near Datta Mandir Khopoli - 410203 Mobile: +91 9930171377 E-mail: vilas.bhosale@siemens.com

Kolhapur RS No. 84-1, Pinac Prasad, Flat No. A-35 New Palace Road, Kolhapur - 416006 Mobile: +91 9850836839 E-mail: vinay.todkar@siemens.com

Kota 406, Manglayatan Appartments Near Jain Mandir, Bhimganj Mandi Kota - 324002 Mobile: +91 9828419111

E-mail: evince and the control of th

Ludhiana 149/64, J Block B.R.S.Nagar, Ludhiana (PB) Mobile: +91 9815434499 E-mail: bhatia.sandeep@siemens.com

Ludhiana R-115 Near DAV School Sarabha Nagar Extension Phase - 2 Pakhowal Road Ludhiana, Punjab Mobile: +91 9888484066 E-mail: padam.sharma@siemens.com

E-mail: padam.snama@siemens.com Madurai Anirudh Block F-Top 3, Vasudhara Apt. 84, TPK Main Road, Andalpuram Madurai - 625003, Tamil Nadu Mobile: +91 9894617776 E-mail: sivaprakasam.r@siemens.com

Meerut E-205, Ansal Courtyard, Roorkee Bypass Modipuram, Meerut - 250110, UP Mobile: +91 972099887 E-mail: singh.vineet@siemens.com

Meerut C-904, Ansal Courtyard, Roorkee Bypass Modipuram, Meerut - 250110, U P Mobile: +91 9999702981 E-mail: shailendra.kumar@siemens.com

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Nashik Flat No. A-4203, Brindavan Gardens Kedar Nagar, Shramik Nagar Near Satpur MIDC, Nashik 422012 Mobile: +91 9619620068 E-mail: jugal.shah@siemens.com

Hemrana Flat No. F 111, Anantraj Apartments Neemrana Distt. Alwar Mobile: +91 9650481919 E-mail: deepak.beniwal@siemens.com

Panipat
H.No. 1452, First Floor
Near Police Chownki, HUDA Housing Board
Sector 24, Panipat
Mobile: +91 9050068602
E-mail: amtinder.singh @siemens.com

Patna Anubhuti Apartment, Flat No. 201 North Anandpuri, West Boring Canal Road Patna - 800001 Mobile: +91 9771414108 E-mail: vikash.prasad@siemens.com

Pondicherry No. 31, 4th Cross Street, Anna Nagar Pondicherry - 605005 Mobile: +91 9840143536 E-mail: lakshmanan.s@siemens.com

Raipur 103 Risabh Regency Near Shri Medishine Hospital New Rajendra Nagar Raipur (C G) - 492006 Mobile: +91 9425601849 E-mail: raghuraj.bisen@siemens.com

Rajahmundry Plot No. 401, SVR Residency Door No. 77-2-29/3, Gandhipuram - 3 Rajahmundry Dist. East Godavari - 533106 Andhra Pradesh Mobile: +91 9948664228 E-mail: naga.ganesna@siemens.com

Rajkot "Vrujraj", Chandanpark Society Opp. Gyanganga Vidhyapith, Nr.Raiya Circle Rajkot - 360005, Gujarat Mobile: +91 9825021026 E-mail: hiren.raithatha@siemens.com

E-mail: hiren.raithatha@siemens.com Ranchi Flat No. A-101, 1st Floor Sundaram Apartment, Kilburn Colony Hinoo, Ranchi, Jharkhand - 834002 Mobile: +91 8294052647 E-mail: shyamal.bhattacharyya@siemens.com Renukoot Raj Bhawan (Near Khatu Shyam Mandir) Awadh Colony, Murdhwa, Renukoot Sonebhadra - 231217 Mobile: +91 9889384222 E-mail: umesh,pandey@siemens.com Rourkela

Rourkela Dl6, Gafoor Colony, 2nd Floor Near LIC Office, Udit Nagar Rourkela - 769012, Odisha Mobile: +91 9776967773 E-mail: prakhar.chaturvedi@siemens.com Rourkela N/6, Flat No. 3A, Civil Township Opposite Hi-tech Medical College & Hospital Rourkela, Odisha - 769004 Mobile: +91 9937972407 E-mail: shouvik.mitra@siemens.com

Rudrapur Flat No. 203, Tower Ganges 'C' Omaxe Reviera Rudrapur - 263153, Uttarakhand Mobile: +91 8477022777 E-mail: ashish.bhatt@siemens.com

Full and the same of the same

E-titair s. Salem Rajagiragham, Lumbini Illam No. 20, Palaniappa Nagar Hasthampatti Salem - 636007 Mobile: +91 8754922245 E-mail: g.suresh@siemens.com

Sonepat H.No. 1103, 1st Floor, Sector-14 Sonepat - 131001, Haryana, India Mobile: +91 9855526122 E-mail: kumar.manish@siemens.com

Sriperumbudur 3/4, Sathyanarayanapuram, Moulivakkam Porur, Chennai - 600 116 Mobile: +91 9884102638 E-mail: venkatesh.janakiraman@siemens.cc

Surat 3/A, Navrachana Society, Opp. D.K.Park Bhatar Road, Surat - 395001 Mobile: +91 9879510191 E-mail: mitul.kapadia@siemens.com

Surat A 604, Stuti Universal, Green City Road Pal-Adajan, Surat - 395009, Gujarat Mobile: +91 9712445504 E-mail: harshwardhan.mishra@siemens

Trichy
1/1209-B, 6th Cross Street, West Extension
Vasan Nagar, Rettai Vaikkal, Vayalur Road
Tirchy - 602102
Mobile: +91 9176609375
E-mail: Muthu.kumar@siemens.com

Trivandrum

No.147-A, Vishnu Bhawan,
Swathy Nagar (SNRA-4), Kazhakuttom,
Trivandrum - 685 582

Mobile: +91 9947957839

E-mail: nobin.babu@siemens.com

Leftnan Hotoland Majpur (Rajasthan) - 313004, India Mobile: +91 9983691888 E-mail: anurag.shah@siemens.com

Ujjain Amit Singh Bhadauria, Tirupati Hights B-block, Flat No. 206, Nana Kheda Dipti Parisar, Ujjain-Indore Road Ujjain - 456010 (MP) Mobile: +91 8889911401 E-mail: Bhadauria.amit@siemens.com

Cyapi Flat No. 401, A Wing, Madhav Gems Nutannagar, Valsad Road, Vapi (East) Valsad Dist, Vapi - 396191 Mobile: +91 9687668690 E-mail: pandey.abhishek@siemens.com

E-maii: panu-y-s-Vapi Shubham Tower No.3, 'C' Wing Flat No.1008, Chala, Vapi Daman Road, Vapi Mobile: +91 9825147957 E-mail: s.anand@siemens.com Vijayawada Laxmi Nivas, 1st Floor, Flat No. FF2 44/13 & 44/12, Plot No. 08 Sundarayya Nagar, Payakapuram Vijayawada - 520015, Andhra Pradesh Mobile: +91 9642351144 E-mail: venkateswar.d@siemens.com

Siemens Ltd. **Digital Factory Control Products R&D Technology Centre** Kalwa Works, Thane Belapur Road

Thane - 400 601 Fax: +91 22 33265627 E-mail: lvsgr-mktg.india@siemens.com

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