

**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 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 <span style="color: orange;">New</span>	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 / asymmetry
- 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



### 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	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

## Selection and Ordering Data: Monitoring Relays



7UG0 712...



7UG0 818...




7UG0 753...



7UG0 84...



7UG0 99...

Type	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 Monitoring relay	Voltage monitoring relay, 3Ø-3W	1 C/O	Self powered	17.5	7UG0 753-1AA20
Current Monitoring 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 Earth leakage relay	Core Balance CT 35mm				7UG0 9-96
	Core Balance CT 70mm				7UG0 9-97
	Core Balance CT 120mm				7UG0 9-99
Earth fault monitoring relay 	Digital earth fault monitoring relay 1Ø-2W, 3Ø-3W, 3Ø-4W	2 C/O	85 - 270 V AC/DC	35	7UG0 861-1BU20
CBCT for Earth Fault monitoring relay*	3P	Core Balance CT 160A			7UG0 9910
	4P				7UG0 9911
	3P	Core Balance CT 250A			7UG0 9912
	4P				7UG0 9913
	3P	Core Balance CT 630A			7UG0 9914
	4P				7UG0 9915

\* 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)

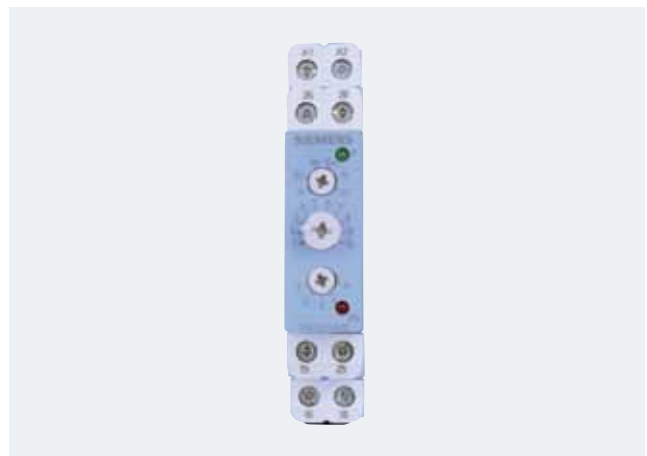
#### Control supply voltage options-

- 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%
	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)	0.1---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	1 C/O	3A / 250V	3A / 250V	3A / 250V
	Contact s @ AC 15, 250VAC	2x 1C/O			
	Contacts @ AC 12, 250VAC	1 C/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		Y		
	Standard Compliance		IEC 61812-1 & IEC 60947-5-1		

## Selection and ordering data: Timing relays



7PV0 712...



7PV0 723...

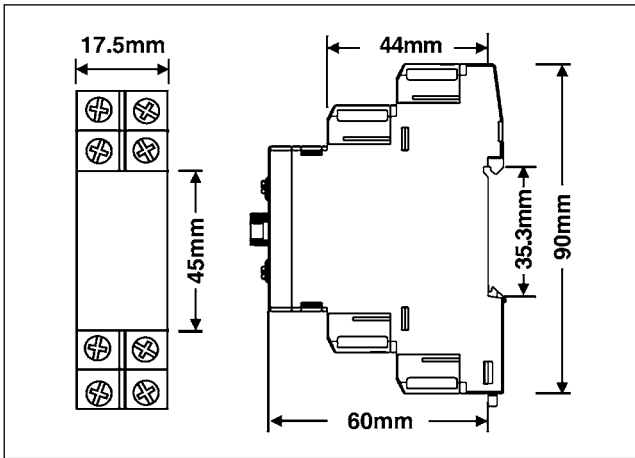


7PV0 732...

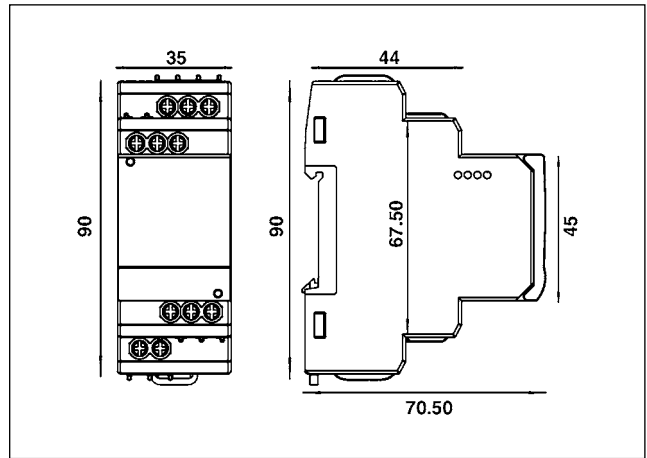
Timer	Description	Contacts	Supply Voltage	Width mm	MLFB
<b>ON Delay</b>	ON Delay, 06 Time Ranges	1 C/O	240V AC	17.5	7PV0 712-1AD20
<b>Multifunction</b>	Multifunction – 10 Functions	1 C/O	12 - 240V DC 24 - 240V AC		7PV0723-1AZ20
	Multifunction – 15 Functions, 8 Time Ranges	1 C/O	20 - 240V AC / DC		7PV0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

## Dimensional drawings: Monitoring relays

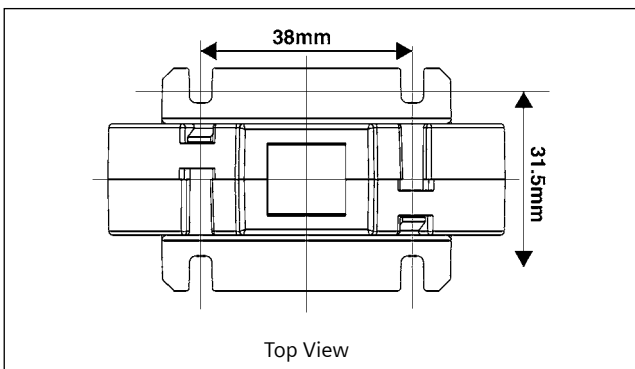
7UG0 7...



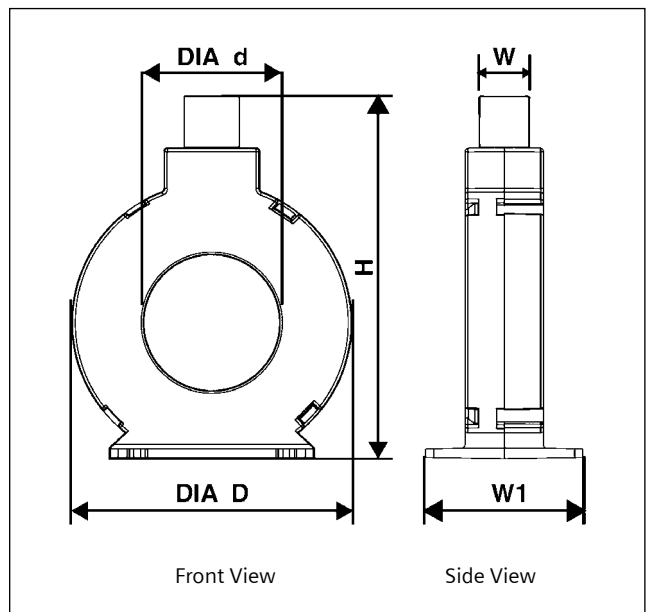
7UG0 8...



7UG0 9... (ELR CBCT)

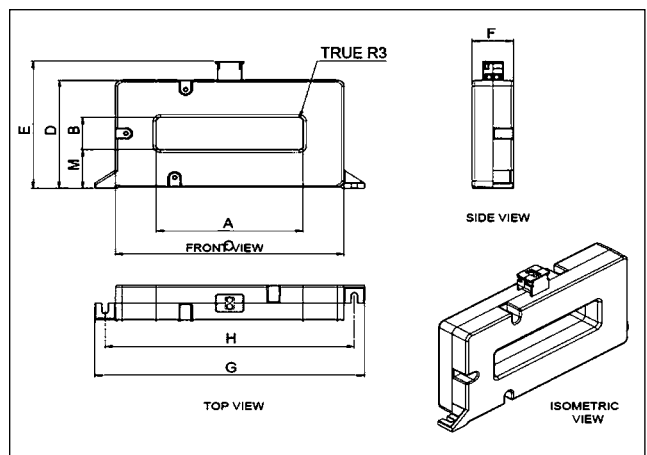


CBCT TYPE	Dimensions (mm)				
	D	d	H	W	W1
7UG0996	70	35	96	10	40
7UG0997	107	70	131	10	40
7UG0999	157	120	184	10	40
STD.TOL.	2 - 3	5 - 6	-	1.5 - 2	-



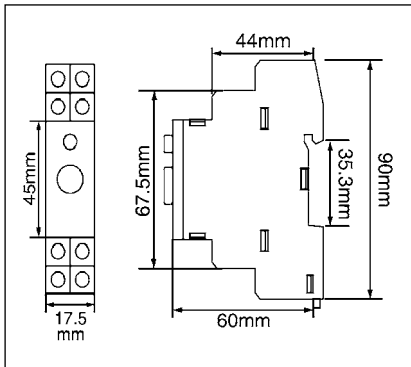
7UG0 9... (EFR CBCT)

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			236	93	109	28	264	250	30
7UG09915	220	50	276	112	128	28	305	290	32

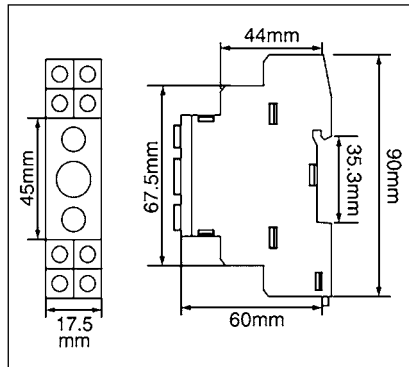


## Dimensional drawings: Timing relays

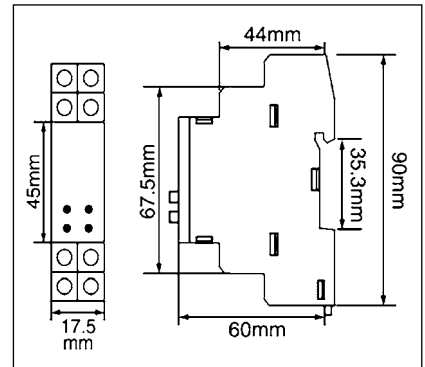
7PV0 712...



7PV0 723...

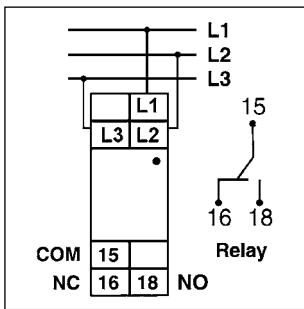


7PV0 732...

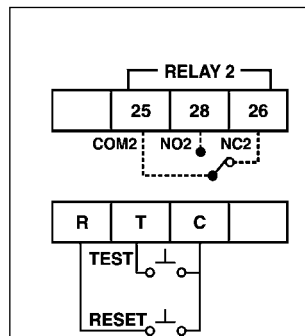


## Terminal Connections:

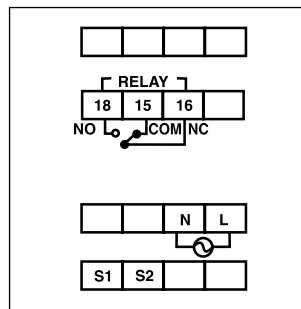
7UG0 71, 7UG0 75...



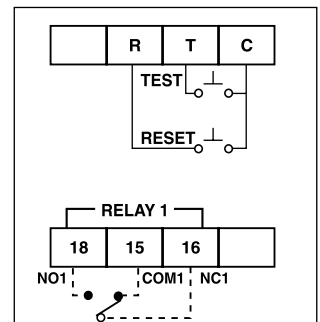
7UG0 84...



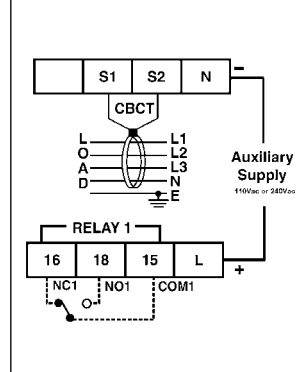
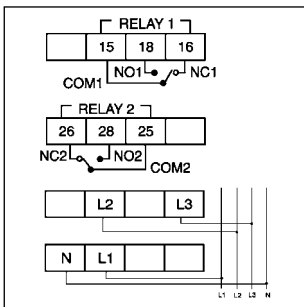
7UG0 82



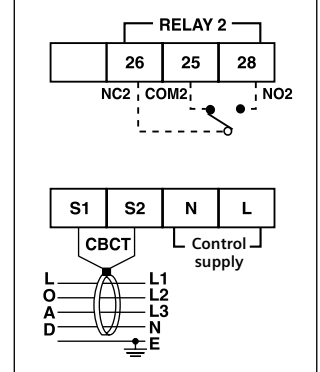
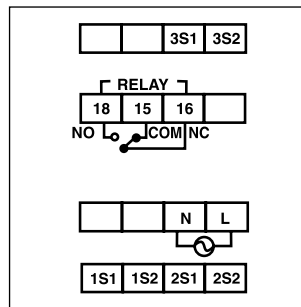
7UG0 86...



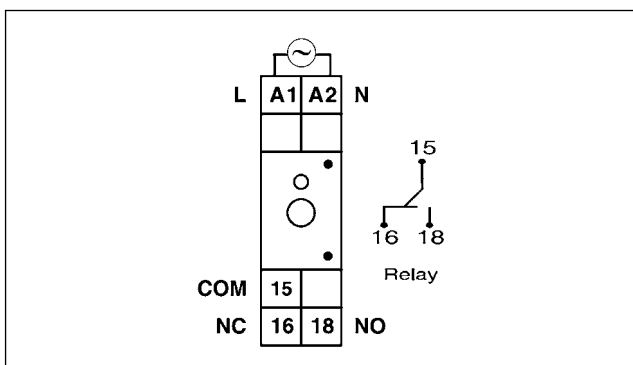
7UG0 818...



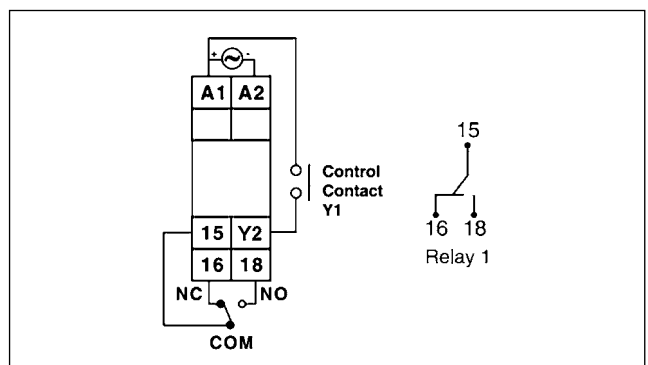
7UG0 83



7PV0 712...



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



## Timing diagram:

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

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

