



# 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 | Neutral Loss Protection <span>New</span> | 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         | ✓                        | ✓                    | ✓                         | ✓                        | ✓                       | ✓                     | ✓                    |                                          |                          |                          |                         |             |              |
|                              | 7UG0 814 <span>New</span> | 1Ø 2W / 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<br>Encoders<br>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 60947-5-1.

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.



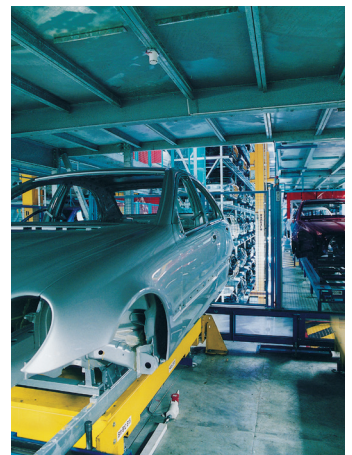
Air conditioning & compressors



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.

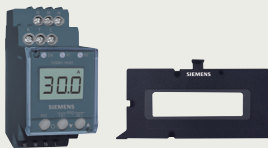


## Monitoring Relays: Technical data

|                           | Parameter                                                            | Unit  | Line monitoring relay                                                             |                                                                                           |                                                                                     | Voltage monitoring relay                                                            |
|---------------------------|----------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                           |                                                                      |       |  |         |  |  |
|                           |                                                                      |       | 7UG0712-1AA20                                                                     | 7UG0818-1CA20                                                                             | 7UG0814-1CA20                                                                       | 7UG0753-1AA20                                                                       |
| Main circuit              | Rated Insulation Voltage [Ui]                                        | V AC  | 480                                                                               | 500                                                                                       |                                                                                     | 480                                                                                 |
|                           | Rated system supply voltage [Ue]                                     | V AC  | 415                                                                               |                                                                                           |                                                                                     |                                                                                     |
|                           | Operating band                                                       | V / A | 154 - 480V (L-L)                                                                  | 280-500V AC (L-L)<br>160-300V AC(L-N)                                                     |                                                                                     | 310 - 480V AC (L-L)                                                                 |
|                           | Rated Control supply (Aux. voltage)                                  | V     | Built in                                                                          |                                                                                           |                                                                                     |                                                                                     |
|                           | Rated Impulse Withstand Voltage [Uimp] (For Overvoltage Category II) | kV    | 2.5                                                                               | 4                                                                                         |                                                                                     | 2.5                                                                                 |
|                           | Rated Frequency                                                      | Hz    | 50/60                                                                             |                                                                                           |                                                                                     |                                                                                     |
|                           | Pollution Degree<br>For PCB<br>For Product                           |       | 2<br>3                                                                            |                                                                                           |                                                                                     |                                                                                     |
| Current/<br>Voltage Range | Measuring range (RMS value)                                          | V / A | 54 - 480 V AC                                                                     | 173-500V AC (L-L)<br>100-300V AC (L-N)                                                    |                                                                                     | 310 - 480 V AC                                                                      |
|                           | Setting range                                                        | V / A | fixed                                                                             | 280-500V AC(L-L)<br>160-300V AC(L-N)                                                      |                                                                                     | 310 - 480 V AC                                                                      |
| Response                  | Response time maximum                                                | ms    | <400                                                                              | <250                                                                                      | <250                                                                                | <200                                                                                |
|                           | Recovery time                                                        | ms    | <400                                                                              | <250                                                                                      | <250                                                                                | <300                                                                                |
|                           | Accuracy                                                             | %     | ±3% of FS for time                                                                | ±5% of setting + 250 ms<br>±1% of setting for Voltage<br>±0.3 Hz of setting for Frequency |                                                                                     | ±5% of FS for Time<br>±1% of FS for Voltage                                         |
|                           | Power consumption                                                    | VA    | 22                                                                                | 30                                                                                        | 50                                                                                  | 22                                                                                  |
| Endurance                 | Mech endurance operating cycles                                      | mio   | 10                                                                                |                                                                                           |                                                                                     |                                                                                     |
|                           | Elect endurance operating cycles<br>AC15:3A @ 250V AC (900 ops./hr)  | mio   | 0.1                                                                               |                                                                                           |                                                                                     |                                                                                     |
| Environmental             | Ambient temperature (Operational)                                    | °C    | 0 to 50                                                                           |                                                                                           |                                                                                     |                                                                                     |
|                           | Ambient temperature (storage)                                        | °C    | -20+70                                                                            |                                                                                           |                                                                                     |                                                                                     |
|                           | Screw tightening torque                                              | NM    | 0.6                                                                               | 0.5                                                                                       | 0.5                                                                                 | 0.6                                                                                 |
|                           | Conductor cross section (Solid)                                      | Sqmm  | 1 x (0.75 to 2.5)<br>2 x (0.5 to 1.5)                                             |                                                                                           |                                                                                     |                                                                                     |
|                           | Conductor cross section fine stranded<br>with end sleeve             | Sqmm  | 1 x (0.5 to 2.5)<br>2 x (0.5 to 1.5)                                              |                                                                                           |                                                                                     |                                                                                     |
|                           | Degree of protection of Device                                       |       | IP20                                                                              |                                                                                           |                                                                                     |                                                                                     |

|              | Parameter                               | Unit    | Line monitoring relay                                                             |                                                                                                                |                                                                                     | Voltage monitoring relay                                                            |
|--------------|-----------------------------------------|---------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|              |                                         |         |  |                              |  |  |
|              |                                         |         | 7UG0712-1AA20                                                                     | 7UG0818-1CA20                                                                                                  | 7UG0814-1CA20                                                                       | 7UG0753-1AA20                                                                       |
| Network      | Protection (AC network)                 | 1Ø - 2W | -                                                                                 | -                                                                                                              | Selectable                                                                          | -                                                                                   |
|              |                                         | 3Ø - 3W | ✓                                                                                 | Selectable                                                                                                     | Selectable                                                                          | ✓                                                                                   |
|              |                                         | 3Ø - 4W | -                                                                                 | Selectable                                                                                                     | Selectable                                                                          | -                                                                                   |
|              | Phase failure                           |         | ✓                                                                                 | ✓                                                                                                              | ✓                                                                                   | ✓                                                                                   |
|              | Phase reversal                          |         | ✓                                                                                 | ✓                                                                                                              | ✓                                                                                   | ✓                                                                                   |
|              | Phase imbalance / Current Assymetry     | V / A   | 30V fixed                                                                         | ✓                                                                                                              | ✓                                                                                   | -                                                                                   |
|              | Neutral loss protection                 |         | -                                                                                 | -                                                                                                              | ✓                                                                                   | -                                                                                   |
|              | Under voltage/ Under current protection | V / A   | -                                                                                 | 280-500 VL-L for 3Ø, 3W<br>160-300 VL-N for 3Ø, 4W                                                             | 160-300 VL-N for 1Ø, 2W<br>280-500 VL-L for 3Ø, 3W<br>160-300 VL-N for 3Ø, 4W       | 310 - 405V                                                                          |
|              | Over voltage/ Over current protection   | V / A   | -                                                                                 | 280-500 VL-L for 3Ø, 3W<br>160-300 VL-N for 3Ø, 4W                                                             | 160-300 VL-N for 1Ø, 2W<br>280-500 VL-L for 3Ø, 3W<br>160-300 VL-N for 3Ø, 4W       | 425 - 480V                                                                          |
|              | Under freq protection                   | Hz      | -                                                                                 | 45 - 65                                                                                                        | 45 - 65                                                                             | -                                                                                   |
|              | Over freq protection                    | Hz      | -                                                                                 | 45 - 65                                                                                                        | 45 - 65                                                                             | -                                                                                   |
| Reset        | Auto/ Manual/ Remote                    |         | A                                                                                 | A/M                                                                                                            | A/M                                                                                 | A                                                                                   |
| Delay        | Hysteresis                              | V / A   | 6V                                                                                | 1 - 99 for V<br>0.2 - 2 for Hz<br>2 - 20% for Asymmetry                                                        |                                                                                     | 2V                                                                                  |
|              | Power on delay                          | s       | 200ms                                                                             | 2-99.9                                                                                                         | 0-999                                                                               | 400ms                                                                               |
|              | Trip time delay                         | s       | fixed                                                                             | 0-99.9                                                                                                         | 0-999                                                                               | 0.2 - 10                                                                            |
|              | Recovery time setting                   | s       | -                                                                                 | 0-99.9                                                                                                         | 0-999                                                                               | -                                                                                   |
| Output       | Output contacts (C/O)                   |         | 1CO                                                                               | 1CO+1CO                                                                                                        | 1CO+1CO                                                                             | 1CO                                                                                 |
|              | Max current (Ith)                       | A       | 5A                                                                                |                                                                                                                |                                                                                     |                                                                                     |
|              | Contacts @ AC 15, 250VAC                | A       | 3A / 250V                                                                         |                                                                                                                |                                                                                     |                                                                                     |
|              | Contacts @ AC 12, 250VAC                | A       | 5A / 250V                                                                         |                                                                                                                |                                                                                     |                                                                                     |
|              | Terminal Connections                    |         | Screw                                                                             |                                                                                                                |                                                                                     |                                                                                     |
|              | Display                                 |         | Green LED on: Power ON<br>Green LED off: Fault indication                         | "ON" LED: Power ON<br>"R1" LED: Fault in Relay 1<br>"R2" LED: Fault in Relay 2<br>LCD: Parameters & Fault type |                                                                                     | Green LED on: Relay ON<br>Red LED on: Power ON                                      |
| Dimensions   | Width                                   | mm      | 17.5                                                                              | 35                                                                                                             | 35                                                                                  | 17.5                                                                                |
|              | Depth                                   | mm      | 60                                                                                | 70.5                                                                                                           | 70.5                                                                                | 60                                                                                  |
|              | Height                                  | mm      | 90                                                                                | 90                                                                                                             | 90                                                                                  | 90                                                                                  |
|              | Weight                                  | g       | 62                                                                                | 135                                                                                                            | 135                                                                                 | 62                                                                                  |
|              | Mounting                                |         | 35mm DIN rail                                                                     |                                                                                                                |                                                                                     |                                                                                     |
|              | Orientation                             |         | Any                                                                               |                                                                                                                |                                                                                     |                                                                                     |
| Certificates | Approbation                             |         | CE                                                                                |                                                                                                                |                                                                                     |                                                                                     |
|              | Standard Compliance                     |         | IEC60947-5-1                                                                      |                                                                                                                |                                                                                     |                                                                                     |

|                           | Parameter                                                            | Unit  | Current monitoring relay                                                                                           | Earth Leakage monitoring relay                                                     | Earth fault monitoring relay                                                           |
|---------------------------|----------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|                           |                                                                      |       |                                   |  |     |
|                           |                                                                      |       | 7UG0 821-1AB20,<br>7UG0 822-1AD20<br>&<br>7UG0 831-1AB20,<br>7UG0 832-1AD20                                        | 7UG0841-1CB20<br>&<br>7UG0842-1CD20                                                | 7UG0861-1BU20                                                                          |
| Main circuit              | Rated Insulation Voltage [Ui]                                        | V AC  | 300                                                                                                                |                                                                                    |                                                                                        |
|                           | Rated system supply voltage [Ue]                                     | V AC  | 230/240 for 7UG082..<br>415 for 7UG083..                                                                           | -                                                                                  | -                                                                                      |
|                           | Operating band                                                       | V / A | 1A - 999A AC (with External CT)                                                                                    | 10mA - 30A                                                                         | 10% - 80% of CBCT current                                                              |
|                           | Rated Control supply (Aux. voltage)                                  | V     | 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                                                                                                                | 2.5                                                                                | 2.5                                                                                    |
|                           | Rated Frequency                                                      | Hz    | 50/60                                                                                                              |                                                                                    |                                                                                        |
|                           | Pollution Degree For PCB For Product                                 |       | 2<br>3                                                                                                             |                                                                                    |                                                                                        |
| Current/<br>Voltage Range | Measuring range (RMS value)                                          | V / A | 0 - 1.19 kA                                                                                                        | 4mA - 30A                                                                          | 1A - 630A                                                                              |
|                           | Setting range                                                        | V / A | Pri: 1A - 999A<br>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    | <200ms                                                                                                             | <30ms for >/- 5x set value<br><50ms for >/- 1x set value                           | <100                                                                                   |
|                           | Recovery time                                                        | ms    | < / = 300ms (On removal of fault)"                                                                                 | 0 -99.9 sec (Settable)                                                             | 0-99.9sec (In auto reset mode)                                                         |
|                           | Accuracy                                                             | %     | ±1% of Setting ±2 Digit for Current<br>±5% of Setting + 200ms for time - Recovery Time, Trip Delay, Power ON Delay | ±5% of setting +100ms<br>±5% of setting for current                                | Current: ± 5% of setting + 2 digits<br>Time: ± (5% of Setting + 100ms)                 |
|                           | Power consumption                                                    | VA    | 15                                                                                                                 | 3                                                                                  | 4                                                                                      |
| Endurance                 | Mech endurance operating cycles                                      | mio   | 10                                                                                                                 |                                                                                    |                                                                                        |
|                           | Elect endurance operating cycles AC15:3A @ 250V AC (900 ops./hr)     | mio   | 0.1                                                                                                                |                                                                                    |                                                                                        |
| Environmental             | Ambient temperature (Operational)                                    | °C    | 0 to 50                                                                                                            |                                                                                    |                                                                                        |
|                           | Ambient temperature (storage)                                        | °C    | -20 to +70                                                                                                         |                                                                                    |                                                                                        |
|                           | Screw tightening torque                                              | NM    | 0.5                                                                                                                |                                                                                    |                                                                                        |
|                           | Conductor cross section (Solid)                                      | Sqmm  | 1 x (0.75 to 2.5)<br>2 x (0.5 to 1.5)                                                                              |                                                                                    |                                                                                        |
|                           | Conductor cross section fine stranded with end sleeve                | Sqmm  | 1 x (0.5 to 2.5)<br>2 x (0.5 to 1.5)                                                                               |                                                                                    |                                                                                        |
|                           | Degree of protection of Device                                       |       | IP20                                                                                                               |                                                                                    |                                                                                        |

|              | Parameter                               | Unit    | Current monitoring relay                                                          | Earth Leakage monitoring relay                                                                                 | Earth fault monitoring relay                                                        |
|--------------|-----------------------------------------|---------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|              |                                         |         |  |                              |  |
|              |                                         |         | 7UG0 821-1AB20,<br>7UG0 822-1AD20<br>&<br>7UG0 831-1AB20,<br>7UG0 832-1AD20       | 7UG0841-1CB20<br>&<br>7UG0842-1CD20                                                                            | 7UG0861-1BU20                                                                       |
| Network      | Protection (AC network)                 | 1Ø - 2W | ✓                                                                                 | ✓                                                                                                              | ✓                                                                                   |
|              |                                         | 3Ø - 3W | ✓ (for 7UG0 83...)                                                                | ✓                                                                                                              | ✓                                                                                   |
|              |                                         | 3Ø - 4W | ✓ (for 7UG0 83...)                                                                | ✓                                                                                                              | ✓                                                                                   |
|              | Pre-warning                             | A       | -                                                                                 | Yes (50-100%)                                                                                                  |                                                                                     |
|              | CBCT error                              | A       | -                                                                                 | ✓                                                                                                              | -                                                                                   |
|              | Earth Leakage / Fault trip setting      | A       | -                                                                                 | 10mA - 30A                                                                                                     | 10% to 80% of FLC                                                                   |
|              | Phase failure                           |         | -                                                                                 | -                                                                                                              | -                                                                                   |
|              | Phase reversal                          |         | -                                                                                 | -                                                                                                              | -                                                                                   |
|              | Phase imbalance / Current Assymetry     | V / A   | ✓                                                                                 | -                                                                                                              | -                                                                                   |
| Reset        | Under voltage/ Under current protection | V / A   | 0 - 999A                                                                          | -                                                                                                              | -                                                                                   |
|              | Over voltage/ Over current protection   | V / A   | 0.5A - 1.19KA                                                                     | -                                                                                                              | -                                                                                   |
| Reset        | Auto/ Manual/ Remote                    |         | A / M                                                                             | A/M/R                                                                                                          | A/M/R                                                                               |
| Delay        | Hysteresis                              | V / A   | 0.1 - 99.9A                                                                       | 5 - 40 % of set value                                                                                          | 1 to 10% of Fault current setting                                                   |
|              | Power on delay                          | s       | 0.5 - 99.9s                                                                       | 0.5 - 99.9s                                                                                                    | 0.5 - 99.9s                                                                         |
|              | Trip time delay                         | s       | 0 - 99.9s                                                                         | 0 - 99.9s                                                                                                      | 0 - 99.9s                                                                           |
|              | Recovery time setting                   | s       | 0 - 99.9s                                                                         | 0 - 99.9s                                                                                                      | 0 - 99.9s                                                                           |
| Output       | Output contacts (C/O)                   |         | 1CO                                                                               | 1CO+1CO                                                                                                        | 1CO+1CO                                                                             |
|              | Max current (Ith)                       | A       | 5A                                                                                |                                                                                                                |                                                                                     |
|              | Contacts @ AC 15, 250VAC                | A       | 3A / 250V                                                                         |                                                                                                                |                                                                                     |
|              | Contacts @ AC 12, 250VAC                | A       | 5A / 250V                                                                         |                                                                                                                |                                                                                     |
|              | Terminal Connections                    |         | Screw                                                                             |                                                                                                                |                                                                                     |
|              | Display                                 |         | LED "ON": Power on<br>"R1" LED: Fault in relay<br>LCD: Parameters & fault type    | "ON" LED: Power ON<br>"R1" LED: Fault in Relay 1<br>"R2" LED: Fault in Relay 2<br>LCD: Parameters & Fault type | LCD with Backlight                                                                  |
| Dimensions   | Width                                   | mm      | 35                                                                                | 35                                                                                                             | 35                                                                                  |
|              | Depth                                   | mm      | 71                                                                                | 70.5                                                                                                           | 70.5                                                                                |
|              | Height                                  | mm      | 90                                                                                | 90                                                                                                             | 90                                                                                  |
|              | Weight                                  | g       | 135                                                                               | 207                                                                                                            | 207                                                                                 |
|              | Mounting                                |         | 35mm DIN rail                                                                     |                                                                                                                |                                                                                     |
|              | Orientation                             |         | Any                                                                               |                                                                                                                |                                                                                     |
| Accessories  |                                         |         | Additional Requirement:<br>External CT, Class 0.5:<br>1A/5A secondary             | CBCT                                                                                                           | CBCT                                                                                |
| Certificates | Approbation                             |         | CE                                                                                |                                                                                                                |                                                                                     |
|              | Standard Compliance                     |         | IEC60947-5-1                                                                      |                                                                                                                |                                                                                     |

|                         |                                                          |           | Temperature Controller relay                                                                                                                                                                                                 |
|-------------------------|----------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                                                          |           | 7UG04801IU20                                                                                                                                                                                                                 |
| 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<br>For PCB<br>For Product               |           | 2<br>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><br>For R & S inputs: <b>2% of setting ± 2°</b><br>(20 min of warm up time for TC inputs)<br>For RTD inputs: <b>2% of setting ± 1°</b>                                         |
| Functions Specification | Control Method                                           |           | 1) PID control with auto tuning<br>2) ON-OFF control<br>3) Heat - Cool (with auto tuning)                                                                                                                                    |
|                         | Propotional 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)<br>Propotional cool band (P): 0.0° to 400°<br>Cyclic cool time: 0.1 to 99.9 sec<br>Dead band: Programable from set point low limit to high limit<br>Derivative time(D): 0 to 9999 sec |
| Endurance               | Mech Endurance                                           | (mio)     | 4                                                                                                                                                                                                                            |
|                         | Elect Indurance AC15 @ 250V AC<br>(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)<br>2 x 0.5 to 2x 1.5                                                                                                                                                                                       |
|                         | Conductor cross section fine stranded with<br>end sleeve | Sq mm     | 2 x (0.5 to 1.5)<br>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 1NO | 2A / 250V                    |
|              | Relay contact @ AC12, 250VAC                                                  | 2x 1NO | 5A / 250V                    |
|              | Digital output for external SSR                                               |        | 12V DC $\pm$ 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 |                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product type                                                           |       | Thermistor Motor Protection relay                                                                                                                                                                                                                     |
| MLFB                                                                   |       | 7UG0881-1BU20                                                                                                                                                                                                                                         |
| Main Circuit                                                           |       |                                                                                                                                                                                                                                                       |
| 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]<br>(For Overvoltage Category II) | kV    | 2.5                                                                                                                                                                                                                                                   |
| Rated Frequency                                                        | Hz    | 50/60                                                                                                                                                                                                                                                 |
| Humidity (non-condensing)                                              | %RH   | 95                                                                                                                                                                                                                                                    |
| Pollution Degree<br>For PCB<br>For Product                             |       | 2<br>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                                                                                                                                                                                                                                                  |
| Function                                                               |       |                                                                                                                                                                                                                                                       |
| Types / Modes                                                          |       | Sensor - PTC's                                                                                                                                                                                                                                        |
| Modes / Operating range / Features                                     |       | Sensor Short: $\leq 40$<br>Sensor Healthy: $\geq 44 (\pm 3)$ to $< 3.8K (\pm 150)$<br>Sensor Trip: $\geq 3.8K (\pm 150)$ to $< 5.5K (\pm 150)$<br>Sensor Open: $\geq 5.5K (\pm 150)$ & Above<br>Sensor Recovery/ Cut-in / Reset: $\leq 1.5K (\pm 60)$ |
| Response & Delays                                                      |       |                                                                                                                                                                                                                                                       |
| 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                                                                                                                                                                                                                                         |
| Indications                                                            |       |                                                                                                                                                                                                                                                       |
| 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)<br>(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)<br>2x 0.5 to 2x 1.5 |
| Conductor cross section (stranded with end sleeve)               | mm <sup>2</sup> | 1x (0.5 to 2.5)<br>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,<br>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 |                                                                                                                                  |
|-------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------|
| Product type                                                            |       | Speed Monitoring relay                                                                                                           |
| MLFB                                                                    |       | 7UG0583-1CU20                                                                                                                    |
| Main Circuit                                                            |       |                                                                                                                                  |
| 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]<br>(For Overvoltage Category II) | kV    | 2.5                                                                                                                              |
| Rated Frequency                                                         | Hz    | 50/60                                                                                                                            |
| Humidity (non-condensing)                                               | % RH  | 95                                                                                                                               |
| Pollution Degree<br>For PCB<br>For Product                              |       | 2<br>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                                                                                                                             |
| Function                                                                |       |                                                                                                                                  |
| Types / Modes                                                           |       | Rate Indicator: Under / Over / Dual Speed<br>Mode: RPS,RPM,RPH                                                                   |
| Modes / Operating range / Features                                      |       | Auto-Ranging resolution<br>Scale factor<br>Initial Bypass time delay<br>Nuisance time delay<br>Range: 0 - 166 RPS / 0 - 9960 RPM |
| Response & Delays                                                       |       |                                                                                                                                  |
| 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)                                                                                                       |
| Indications                                                             |       |                                                                                                                                  |
| 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)<br>(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)<br>2x 0.5 to 2x 1.5                               |
| Conductor cross section (stranded with end sleeve)                | mm <sup>2</sup> | 1x (0.5 to 2.5)<br>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                                                                |
| Accessories (in packing)                                          |                 | 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.....

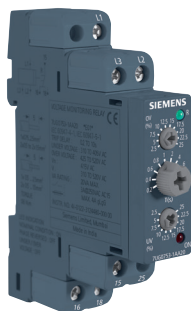
| Parameters                                                              | Units |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product type                                                            |       | Water Level ControllerRelay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| MLFB                                                                    |       | 7UG0885-1JU20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Main Circuit                                                            |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 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]<br>(For Overvoltage Category II) | kV    | 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Rated Frequency                                                         | Hz    | 50/60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Humidity (non-condensing)                                               | % RH  | 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Pollution Degree<br>For PCB<br>For Product                              |       | 2<br>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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Function                                                                |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Types / Modes                                                           |       | Delivery, Suction & Dual tank mode<br>(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> |
| Response & Delays                                                       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Output                                                                  |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Mechanical life (operating cycle)                                       |       | 5 X 10 <sup>6</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Electrical Life (operating cycle)<br>AC15: 250V/2A @ 900 op/hr          |       | 50,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Contact configuration                                                   |       | 1NO + 1NO Dedicated for alarm in single tank mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Parameters                                         | Units           |                                           |
|----------------------------------------------------|-----------------|-------------------------------------------|
| 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)<br>2x 0.5 to 2x 1.5      |
| Conductor cross section (stranded with end sleeve) | mm <sup>2</sup> | 1x (0.5 to 2.5)<br>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)<br>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 x 1 CO          | Self Powered      | 35       | 7UG0814-1CA20<br>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-4W                             | 1 CO              | 230V AC           | 35       | 7UG0 832-1AD20                  |
| Earth Leakage Relay                                      | Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W, 3Ø-4W                       | 2 x 1 CO          | 110V AC           | 35       | 7UG0 841-1CB20                  |
|                                                          | Digital Earth Leakage Monitoring, 1Ø-2W, 3Ø-3W, 3Ø-4W                       | 2 x 1 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 x 1 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 x 1 CO          | 110 - 240 V AC/DC | 35       | 7UG0881-1BU20                   |
| Speed monitoring relay <span>New</span>                  | Speed monitoring relay                                                      | 2 X 1 CO          | 110 - 240 V AC/DC | 70       | 7UG0583-1CU20                   |
| Water level controller relay <span>New</span>            | Water level controller relay                                                | 2 X 1 NO          | 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

### 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

### 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<br>(10 functions)                                                                                                                                                                                                                                         | Multi-function<br>(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]<br>(For Overvoltage Category II) | KV             | 2.92                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|              | Rated Frequency                                              | Hz             | 50/60                                  |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|              | Dielectric test Voltage                                      | KV             | 1.44                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|              | Pollution Degree<br>For PCB<br>For Product                   |                | 2<br>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:<br>3A @ 250V AC (900 ops./hr)          | (mio)          | 0.1                                    | 0.07                                                                                                                                                                                                                                                                     | 0.1                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              | Ambient temperature<br>(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)<br>2 x 0.5 to 2x 1.5 | 1 x (0.75 to 2.5)<br>2 x 0.5 to 2x 1.5                                                                                                                                                                                                                                   | 1 x (0.75 to 2.5)<br>2 x 0.5 to 2x 1.5                                                                                                                                                                                                                                                                                                                                                                                          |
|              | Conductor cross section fine<br>stranded with end sleeves    | Sq mm<br>Sq mm | 2 x (0.5 to 1.5)<br>1 x (0.5 to 2.5)   | 2 x (0.5 to 1.5)<br>1 x (0.5 to 2.5)                                                                                                                                                                                                                                     | 2 x (0.5 to 1.5)<br>1 x (0.5 to 2.5)                                                                                                                                                                                                                                                                                                                                                                                            |
|              | Degree of protection of device                               |                | IP20                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Timing       | Trip time setting                                            | s              | 0.1 sec to 3 hrs<br>(06 time ranges)   | 0.1---1s<br>1---10s<br>6---60s<br>1---10min<br>6---60 min<br>1---10hr<br>2---20hr                                                                                                                                                                                        | 0.1 sec to 999 hrs                                                                                                                                                                                                                                                                                                                                                                                                              |
| Function     | 10 modes                                                     |                | On delay                               | On delay (A)<br>Delay with totalise (At)<br>Single Shot (B)<br>Delay on Break (C)<br>Cyclic equal off first (with<br>external contact) (D)<br>Cyclic equal on first (Di)<br>Interval (H)<br>Interval with Totalise (Ht)<br>Pulse output (Pe)<br>Interval after break (W) | 15 functions<br>On delay (A)<br>Interval (B)<br>Asymmetrical cyclic OFF first (C)<br>Asymmetrical cyclic ON first (D)<br>Cyclic equal OFF first (E)<br>Cyclic equal ON first (F)<br>Pulse output (H)<br>Delay on break (J)<br>Delay on make / break (K)<br>Interval after break (L)<br>Single Shot (P)<br>Retriggerable Single Shot (Q)<br>Latching Relay (R)<br>Delay on break with Totalise (T)<br>Interval with Totalise (U) |

|                |                                                                      |         | On delay                              | Multi-function<br>(10 functions) | Multi-function<br>(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,<br>Green LED:Rel ON | 1 Relay LED<br>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                           |                                  |                                  |

## Selection and ordering data: Timing relays



7PV0 712...



7PV0 723...

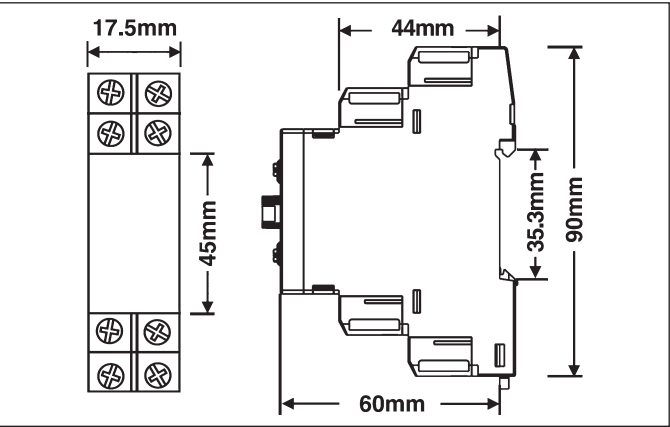


7PV0 732...

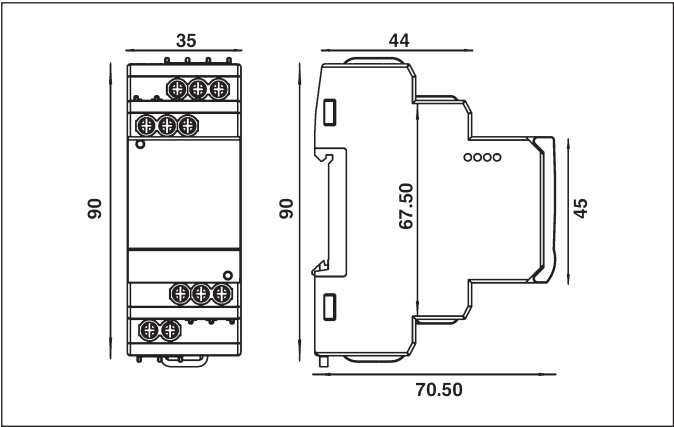
| Timer         | Description                                    | Contacts | Supply Voltage               | Width mm | MLFB           |
|---------------|------------------------------------------------|----------|------------------------------|----------|----------------|
| ON Delay      | ON Delay,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

Dimensional drawings: Monitoring relays

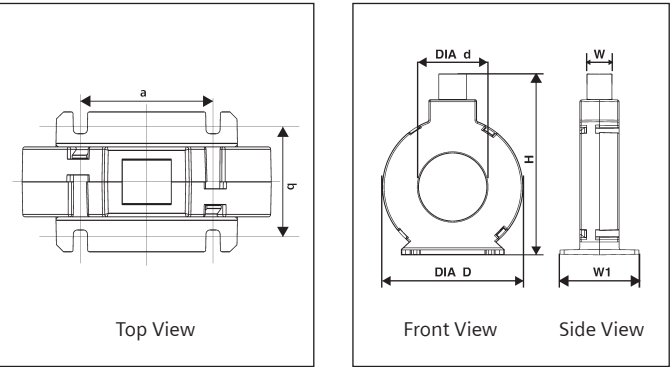
7UG0 7...



7UG0 8...

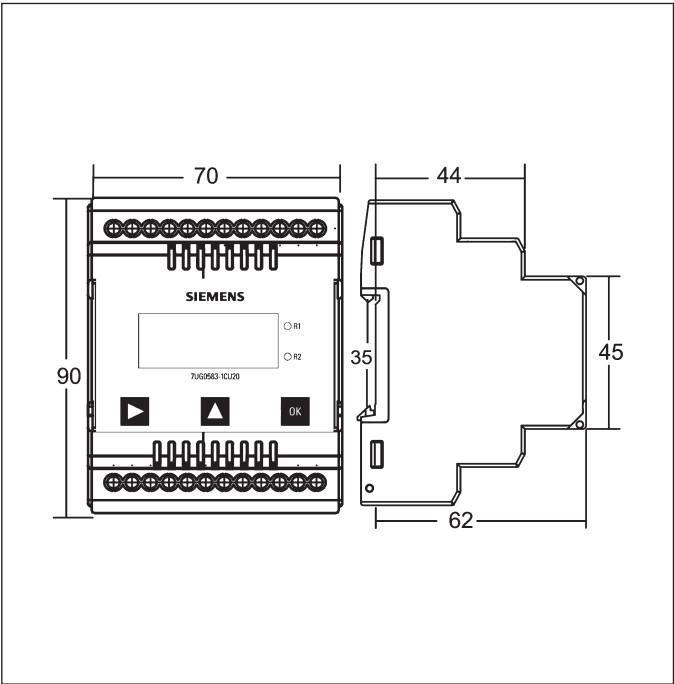


7UG0 9... (ELR CBCT)



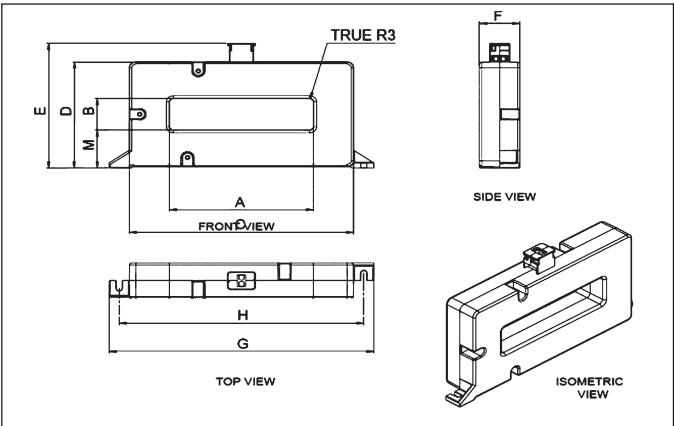
| CBCT TYPE | Dimensions (mm) |       |     |         |    |     |      |
|-----------|-----------------|-------|-----|---------|----|-----|------|
|           | D               | d     | H   | W       | W1 | a   | b    |
| 7UG0996   | 70              | 35    | 96  | 15      | 40 | 38  | 31.5 |
| 7UG0997   | 107             | 70    | 131 | 15      | 40 | 38  | 31.5 |
| 7UG0999   | 157             | 120   | 184 | 15      | 40 | 38  | 31.5 |
| 7UG0994   | 268             | 210   | 270 | 25      | 55 | 120 | 39.6 |
| 7UG0995   | 377             | 310   | 380 | 25      | 65 | 200 | 39.6 |
| STD.TOL.  | 2 - 3           | 5 - 6 | -   | 1.5 - 2 | -  | -   | -    |

7UG0 5...



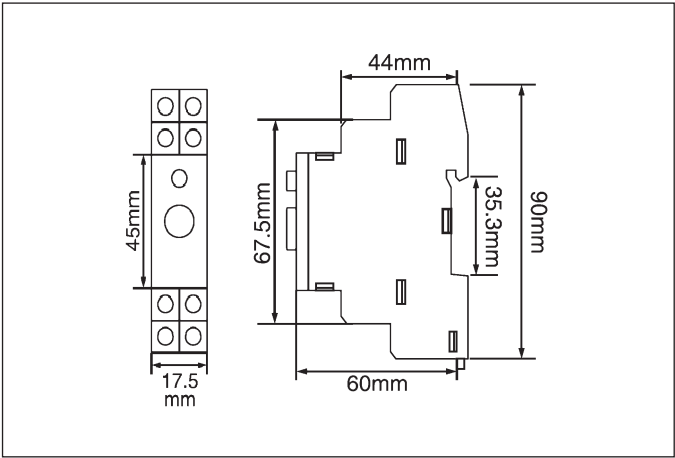
7UG0 9... (EFR CBCT)

| 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 |

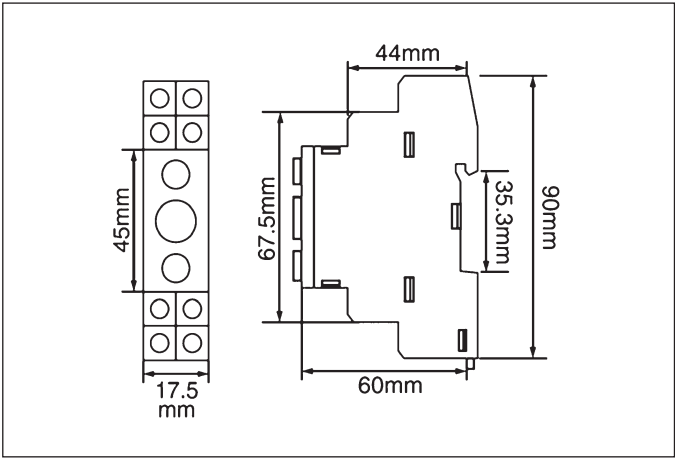


Dimensional drawings: Timing relays

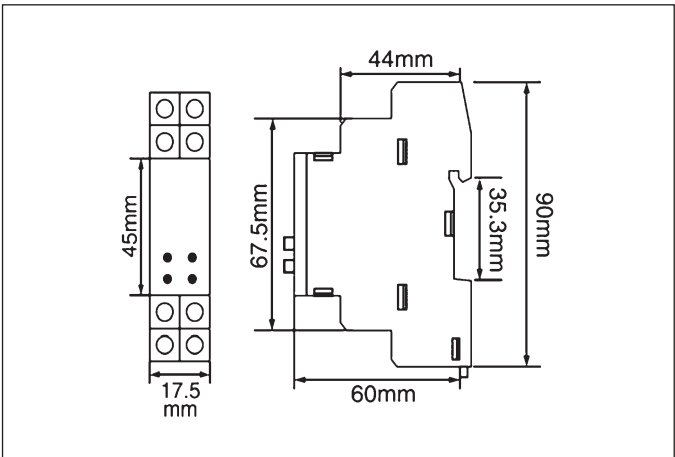
7PV0 712...



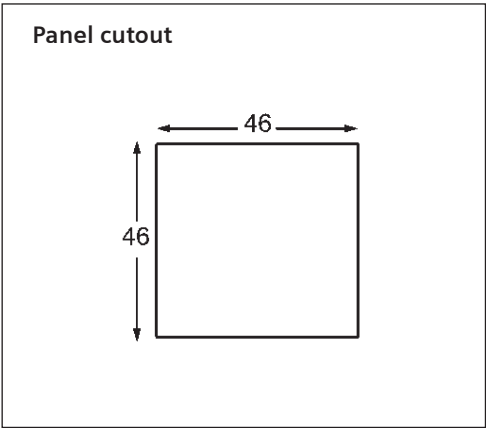
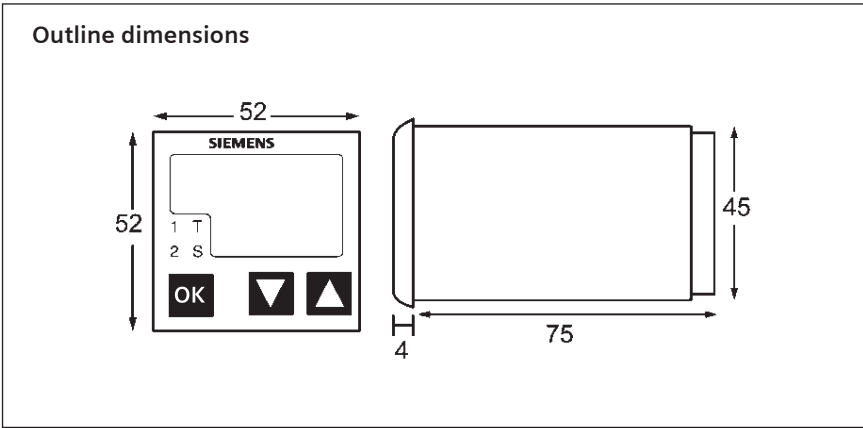
7PV0 723...



7PV0 732...

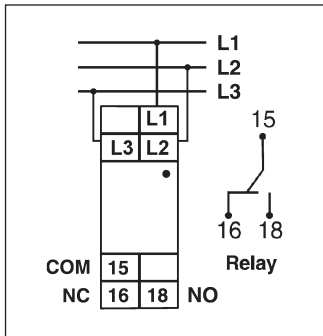


Dimensional drawings: Temperature controller relay

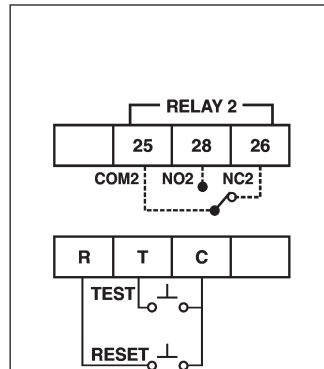


## Terminal Connections:

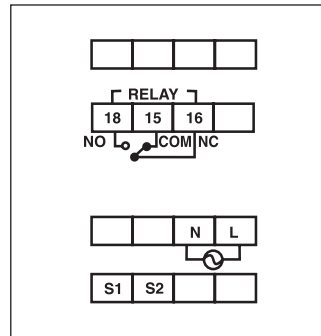
7UG0 71, 7UG0 75...



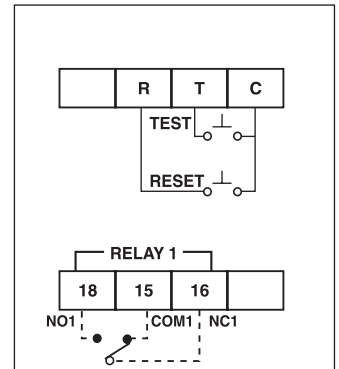
7UG0 84...



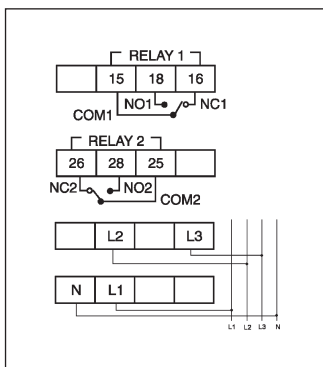
7UG0 82



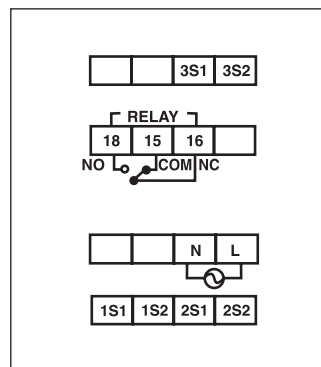
7UG0 86...



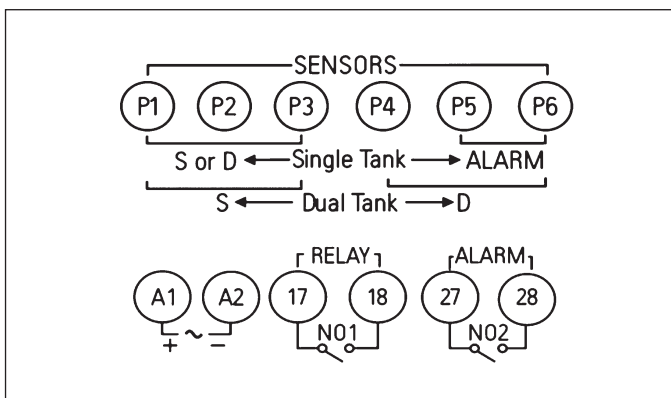
7UG0 818...



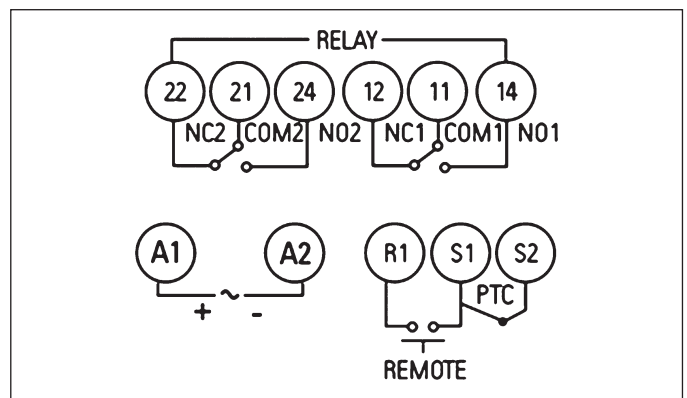
7UG0 83



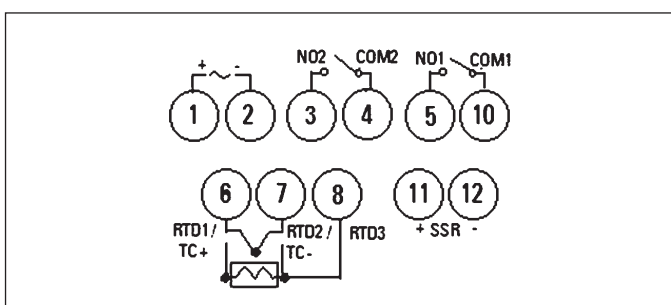
7UG0 885...



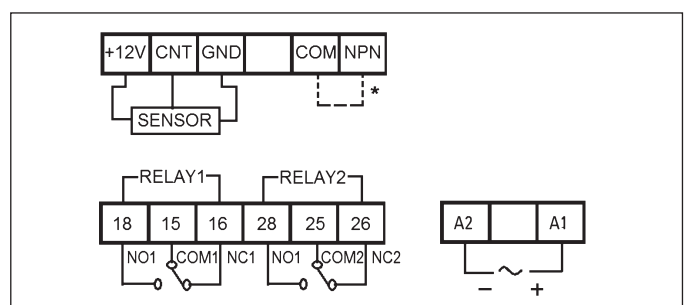
7UG0 881...



7UG0 48...

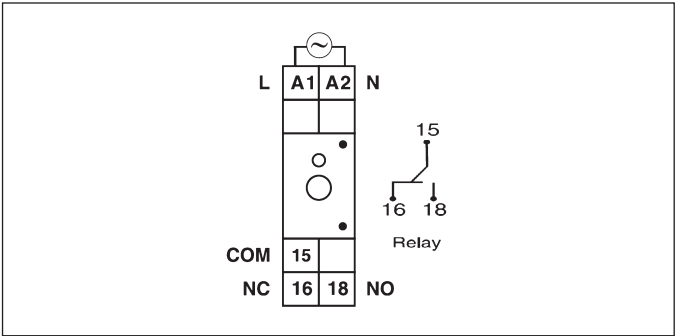


7UG0 58...

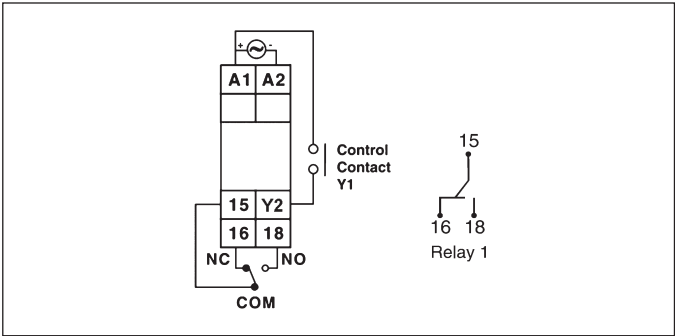


Terminal Connections:

7PV0 712...



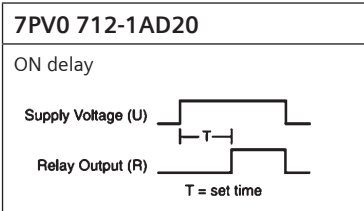
7PV0 723... / 7PV0732...



Timing diagram:

| 7PV0732 (Digital 15 func) / 7PV0723 (10 func) |                              |                                                            |                                                      |
|-----------------------------------------------|------------------------------|------------------------------------------------------------|------------------------------------------------------|
| A. ON delay                                   | B/H. Interval                | T. Delay on break with Totalise<br>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<br>(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



## Notes

## Notes

# Your partners

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