TEMPATRON

IR32 and IRDR Range of Controllers

Reverse   Direct
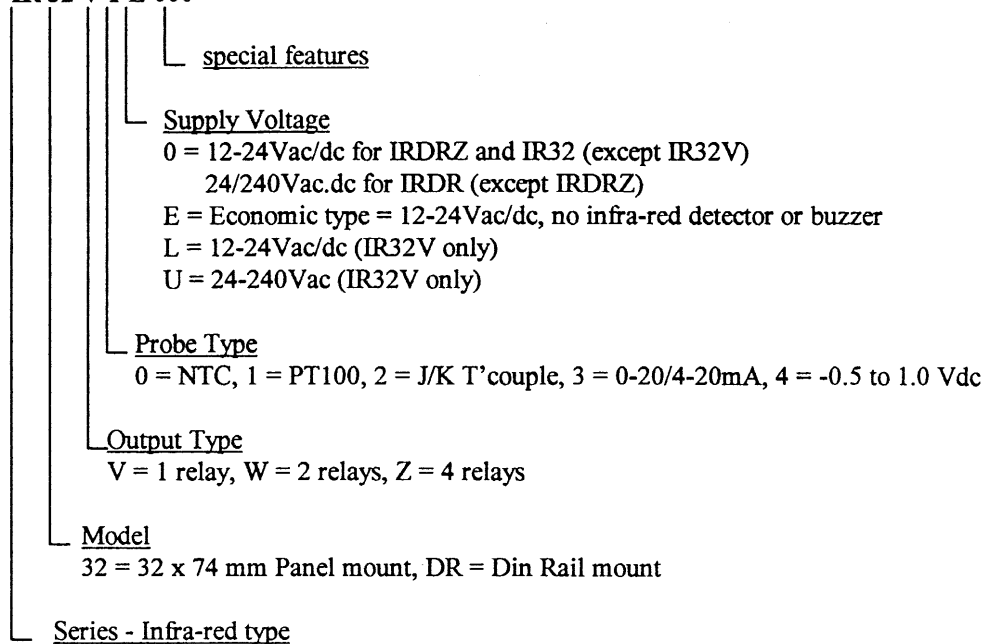
PRG
mute

SEL

▲

▼

IR32/DR Industrial Range of Temperature and Process Controllers

The IR32 range of controllers has been developed from the highly successful refrigeration thermostats manufactured by Carel in Italy. These controllers have revolutionised the thinking behind temperature and process control. Current developments in this type of instrument have been based on the assumption that industrial applications require ever increasing sophistication in control techniques, giving tight control and rapid response to the most stringent and variable processes.

However, the vast majority of applications do not require such complicated and sophisticated techniques. This is

Part Number System

IR 32 V 1 E 000

       └ special features

     └ Supply Voltage
      0 = 12-24Vac/dc for IRDRZ and IR32 (except IR32V)
       24/240Vac.dc for IRDR (except IRDRZ)
      E = Economic type = 12-24Vac/dc, no infra-red detector or buzzer
      L = 12-24Vac/dc (IR32V only)
      U = 24-240Vac (IR32V only)

    └ Probe Type
     0 = NTC, 1 = PT100, 2 = J/K T'couple, 3 = 0-20/4-20mA, 4 = -0.5 to 1.0 Vdc

   └ Output Type
    V = 1 relay, W = 2 relays, Z = 4 relays

  └ Model
   32 = 32 x 74 mm Panel mount, DR = Din Rail mount

 └ Series - Infra-red type

Front Panel Functions

PROG / MUTE	: When momentarily pressed, enters all new parameters selected from other keys. When pressed for > 5 secs, accesses primary parameters. When pressed simultaneously with **SEL** key, accesses Function Modes , via code 22. When pressed simultaneously with **SEL** key, accesses Advanced Parameters, via code 77. Cancels alarm buzzer when activated. Note: this does not reset the alarm conditions.
SEL	: When momentarily pressed, accesses Set-Point. When pressed simultaneously with **PROG** key, accesses Function Modes and Advanced Parameters. Once a parameter has been accessed, enables variable adjustment via ∇ and Δ keys, and acknowledgement of new value.
Δ∇	: Allow forward or reverse rotation through program parameters and up or down adjustment of variables.

O Reverse : Reverse Action Led. Flashes cyclically for each output activated in Reverse Mode.

O Direct : Direct Action Led. Flashes cyclically for each output activated in Direct Mode.

888 : 3 digit, green Led display. Displays Process Value, Alarm Codes, Set-Point, parameter codes and parameter values, when in program mode.

Function Modes

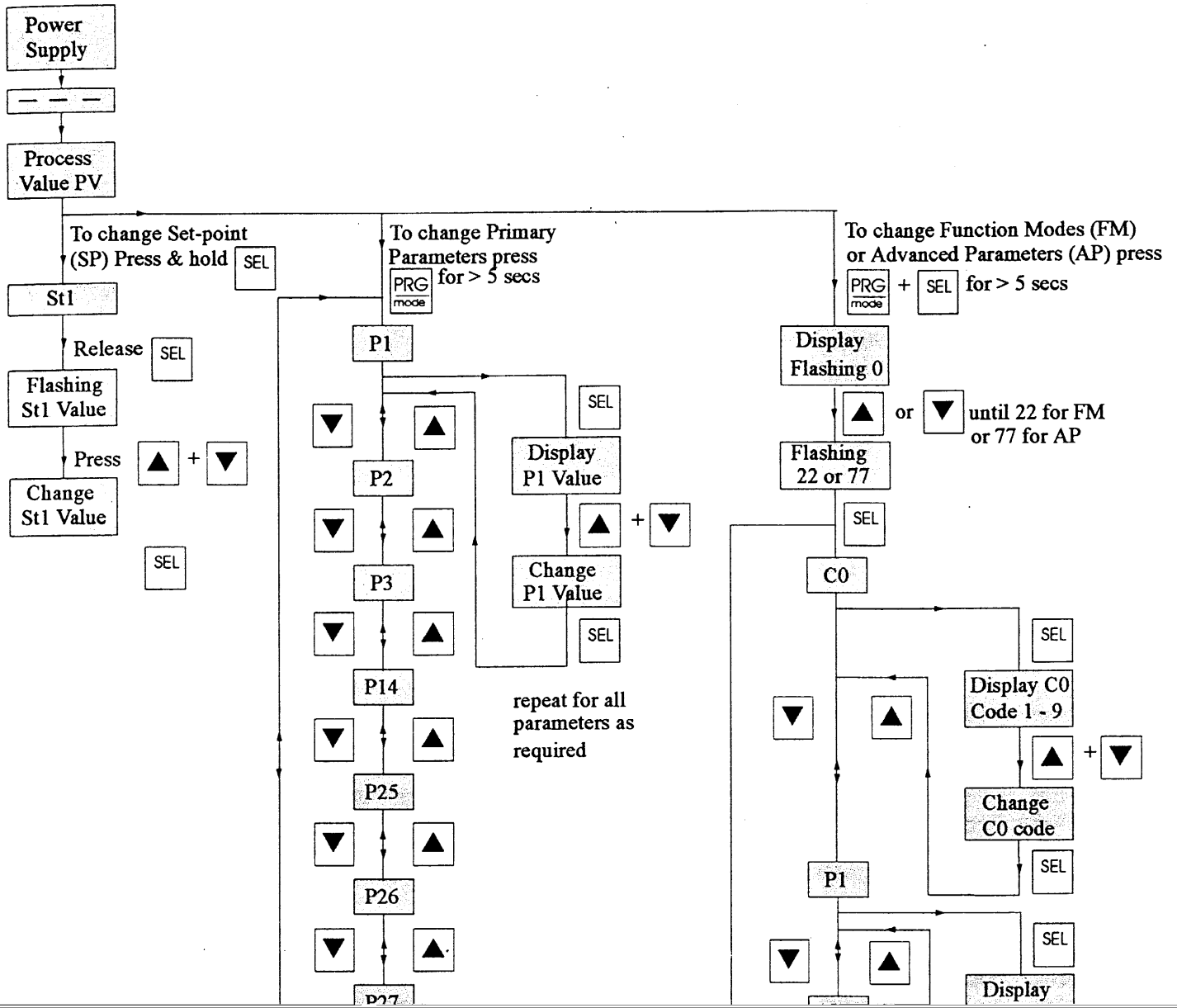| Mode No.	Function
1	Direct action mode with adjustable Set-Point (SP) and differential (Hysteresis) above SP.
2	Reverse action mode with adjustable Set-Point (SP) and Hystereris below SP.
3	Reverse action mode with adjustable SP, Hysteresis and Dead-Band (DB). For 2 (W) and 4 (Z) output models, DB is equi-spaced about SP.
4	Proportional (P) action mode with adjustable SP, proportional Band (PB) and DB. As for Mode 3, DB is equi-spaced around SP for W and Z models. A Proportional + Intergral (PI) mode is also available by selecting the correct variable in parameter C5.
5	Alarm Mode, operating as for Mode 3 but with one output dedicated as an alarm signal. For single output (V) models the output is an Alarm, for W models one output is dedicated to a high/low alarm and, for Z models, two outputs are dedicated to high and low alarms respectively.
6	Direct or Reverse action mode, selectable from the digital input (DI). DI open = Direct DI closed = Reverse.
7	Direct action mode with two Set-Points SP1 and SP2, each with it's own adjustable Hysteresis and selectable from the digital input. DI open = SP1/HY1 and DI closed = SP2/HY2.
8	Reverse action mode with functions as for Mode 7.
9	Direct plus Reverse action mode (Heat + Cool) with each dedicated to one output (2 for Z models) providing two independant Set-Points. This mode is only available for W and Z models.

Error Messages

Message	Description	Cause	Solution
Er0	Probe error	Open or short circuit probe or connection.	Check connections and probe.
Er1(NTC2)	Probe error	As for Er0.	As for Er0.
Er2	Memory error	Supply disconnected during programming. Electrical noise.	Turn off, then on holding down **SEL** Replace unit, if persistant.
Er3	External Alarm	Digital Input contact open	See C29, check external contacts.
Er4	High Alarm	Input has exceeded P26 for > P28 period	Check parameters P26 and P28.
Er5	Low Alarm	Input is below P25 for > P28 period	Check parameters P25 and P28
Note: Press **PROG/MUTE** to silence alarm buzzer but check appropriate parameters to reset outputs.			

4

Parameter Table

Code	Function	Default Value	Range	Parameter Access Prim	FM	Adv
St1	Set-Point 1	20	see spec.			
St2	Set-Point 2 (Function Modes 6, 7, 8, 9)	40	see spec.			
C0	Function Mode	2	1 to 9		X	X
P1	Hysteresis of SP1	2	0.1 to 99.9	X	X	X
P2	Hysteresis of SP2 (Function Modes 3, 4, 5, 7, 8, 9)	2	0.1 to 99.9	X	X	X
P3	Dead-Band (Function Modes 3, 4, 5)	2	0 to 99.9	X	X	X
C4	Compensation Coefficient - NTC only (see operation manual)	0.5	-2.0 to 2.0			X
C5	Control action in Function Mode 4. 0 = Prop (P), 1 = Prop + Integ (PI)	0	0 or 1			X
C6	Delay between on routines of two different outputs	5	0 to 999 secs			X
C7	Minimum time between on routines of the same output	0	0 to 15 mins			X
C8	Minimum off time of the same output	0	0 to 15 mins			X
C9	Minimum on time of the same output	0	0 to 15 mins			X
C10	Status of outputs with probe(temperature) alarm : 0 = all relays de-energised 1 = all relays energised 2 = Direct action relays energised, all others de-energised 3 = Reverse action relays energised, all others de-enegised	0	0 to 3			X
C11	Output rotation (Function Modes 1, 2, 6, 7, 8 and Models W & Z only) 0 = no rotation 1 = rotation of 2 out of 4 outputs (model Z only) 2 = 2+2 rotation (Compressors on outputs 1 & 2, model Z only)	0	0 to 3			X

Program Parameter Map

```
┌──────────┐
│ Power    │
│ Supply   │
└──────────┘
     │
┌──────────┐
│ – – –    │
└──────────┘
     │
┌──────────┐
│ Process  │
│ Value PV │
└──────────┘
     │
```

To change Set-point
(SP) Press & hold [SEL]

To change Primary
Parameters press
[PRG mode] for > 5 secs

To change Function Modes (FM)
or Advanced Parameters (AP) press
[PRG mode] + [SEL] for > 5 secs

```
┌──────────┐
│ St1      │
└──────────┘
     │  Release  [SEL]
┌──────────┐
│ Flashing │
│ St1 Value│
└──────────┘
     │  Press  [▲] + [▼]
┌──────────┐
│ Change   │
│ St1 Value│
└──────────┘
              [SEL]
```

Primary Parameters column

```
┌──────┐
│ P1   │
└──────┘
 [▼] [▲]
┌──────┐
│ P2   │
└──────┘
 [▼] [▲]
┌──────┐
│ P3   │
└──────┘
 [▼] [▲]
┌──────┐
│ P14  │
└──────┘
 [▼] [▲]
┌──────┐
│ P25  │
└──────┘
 [▼] [▲]
┌──────┐
│ P26  │
└──────┘
 [▼] [▲]
┌──────┐
│ P27  │
└──────┘
```

[SEL]

```
┌──────────┐
│ Display  │
│ P1 Value │
└──────────┘
     │  [▲] + [▼]
┌──────────┐
│ Change   │
│ P1 Value │
└──────────┘
     [SEL]
```

repeat for all
parameters as
required

Function Modes / Advanced Parameters column

```
┌──────────┐
│ Display  │
│ Flashing 0│
└──────────┘
     │  [▲] or [▼]  until 22 for FM
     │              or 77 for AP
┌──────────┐
│ Flashing │
│ 22 or 77 │
└──────────┘
     [SEL]
┌──────────┐
│ C0       │
└──────────┘
 [▼] [▲]
┌──────────┐
│ P1       │
└──────────┘
 [▼] [▲]
```

[SEL]

```
┌──────────────┐
│ Display C0   │
│ Code 1 - 9   │
└──────────────┘
     │  [▲] + [▼]
┌──────────────┐
│ Change       │
│ C0 code      │
└──────────────┘
     [SEL]
```

[SEL]

```
┌──────────┐
│ Display  │
└──────────┘
```

Technical Specification

Input Options:	NTC, PT100, J or K T'Couple, 0 - 20mA, 4 - 20mA, -0.5 to 1.0 Vdc according to model (see part number).

Operating range:

NTC:	-50 to +90 ° C
PT100:	-99 to +600 ° C
J T/c:	-99 to +800 ° C
K T/c:	-99 to +999 ° C
mA/V:	-99 to 999 scaleable

Resolution: 0.1 or 1 unit, according to displayed value (autoranging)

Accuracy: +/- 0.5% of max. range

Supply Voltage: See Part Numbering system. All values are +/- 10%.

Power Consumption: 3VA max.

Probe supply: 10Vdc @ 30mA max. supplied by controller.

Working Temperature: 0 to 50 ° C

Storage Temperature: -10 to 70 ° C

Relative Humidity: 90% rH max, non-condensing.

Output Configuration:

IR32 for NTC:	1,2,or 4 SPDT relays
IR32V:	1 SPDT relay
IR32W:	1 SPST + 1 SPDT relays
IR32Z:	1 SPST + 3 SPDT relays
IRDR (except Z):	1 or 2 SPDT relays
IRDRZ:	2 SPDT + 2 SPST relays

Relay Ratings: 8A/250Vac max with 2000VA max switching power (10Amps inrush)

Protection Index: IR32: IP65, IRDR: IP40

Fire Retardancy: Plastic case and relays: ECC EN 60730-1

Dimensions:

IR32:	facia: 75 x 33mm, depth: 64mm behind panel, cut-out: 71 x 29mm
IRDR:	70mm wide x 88mm high x 59.1mm deep

EC Compatibility: Comply to Directive 89/336/EEC(modified to 92/31/EEC) and are designed to meet the EN60555-2 standards on emmissions and EN50082-1 standards on immunity. These products may be assembled to machinery covered by Directive 89/392/EEC and meet the low volage Directive 73/23/EEC