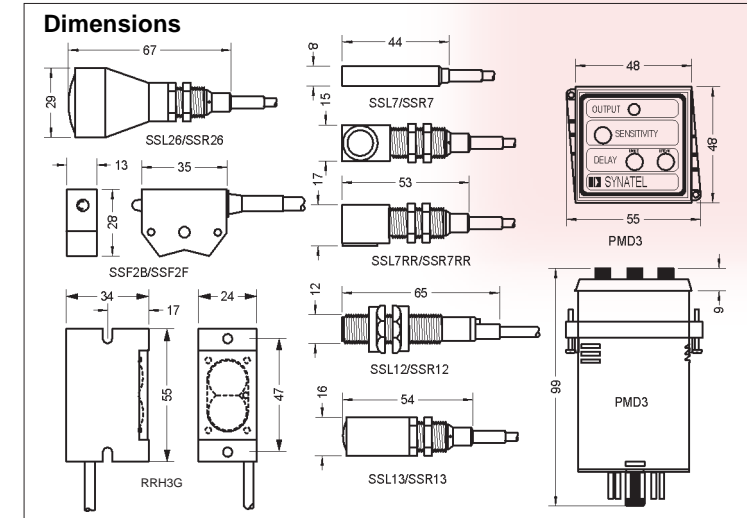


## PHOTOELECTRIC SENSOR RANGE

Synatel produce a range of photoelectric sensors, in different styles and packages, to suit a wide variety of applications. The sensors are available as; throughbeam (object 'breaks' the sensing beam), reflex (object reflects light back to sensor) or polarised retro-reflex units (sensor works with a reflector and the object 'breaks' the beam).

## MODULAR RANGE SERIES SSP1

An 11 pin, international relay base, plug-in control module (PMD3) for use with a range of heads to fulfil a variety of applications.



## SPECIFICATION - MODULAR SENSOR HEADS

Type	Range (metres)	Weight	Material
<b>Through Beam</b>			
Emitter SSL7	1.25M	70g	Anodised Aluminium
Receiver SSR7	1.25M	70g	Anodised Aluminium
Emitter SSL7RR	1.25M	90g	Anodised Aluminium
Receiver SSR7RR	1.25M	90g	Anodised Aluminium
Emitter SSL12	1.0M	75g	Moulded Polycarbonate
Receiver SSR12	1.0M	75g	Moulded Polycarbonate
Emitter SSL13	5.0M	90g	Brass/Anodised Aluminium
Receiver SSR13H	5.0M	90g	Brass/Anodised Aluminium
Emitter SSL26	10M	100g	Brass/Nylon
Receiver SSR26	10M	100g	Brass/Nylon
<b>Retro Reflex</b>			
RRH3G	2.0M	110g	Moulded ABS
<b>Reflex</b>			
SSF2B Unfocussed	0.05M	95g	Moulded Polycarbonate
SSF2F Focussed	0.02M optimum	95g	Moulded Polycarbonate

## SPECIFICATION - PMD3 MODULE

Supply (Standard Unit)	110/230V ac 50/60 Hz, 3VA
Output	S.P.C.O relay. 240V 3A non-inductive
Output Mode	Normally De-energised (output off with beam broken). For reverse operation, normally on with beam broken, add suffix 'X' after model number. (PMD3X)

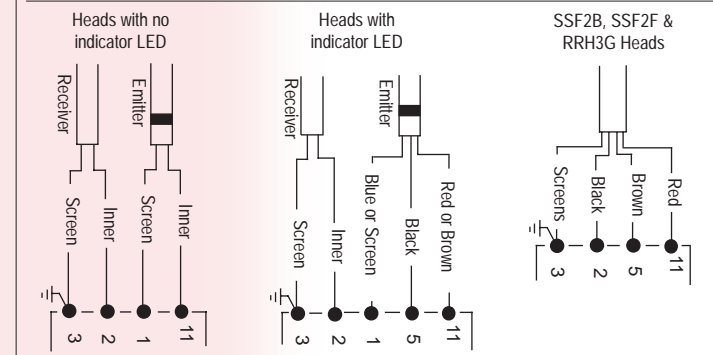
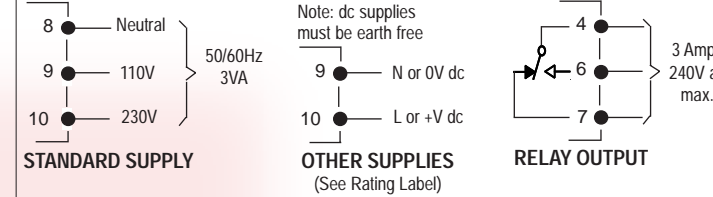
## SPECIFICATION - GENERAL

Supply	10-30V dc
Output	Fully protected, opto-isolated transistor. Rated@ 100mA 30V dc max.
Indication	Output state and variable intensity alignment
Termination	2M PVC sheathed cable or 4 pin connector
Sensitivity	0-100% on receiver, reflex and retro reflex

## SELECTION CHART

Model	Type	Operating Range	Weight
PP2JO	Retro Reflex	5.0M	280g
PP2JO/C	Retro Reflex	5.0M	100g
PR2JO	Reflex	0.75M	280g
PR2JO/C	reflex	0.75M	100g
PT2JO	Receiver	> 6.0M	280g
PL2JV	Emitter	> 6.0M	280g
PT2JO/C	Receiver	> 6.0M	100g
PL2JV/C	Emitter	> 6.0M	100g

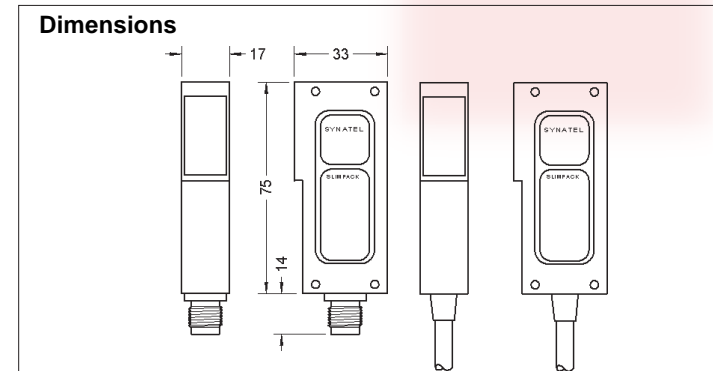
## Connections



Accessories: 11 pin plug in relay base, reflectors.

## SLIMPACK RANGE

A range of reflex, polarised retro-reflex and through beam heads in a compact format ideal for many different applications.



## SPECIFICATION - GENERAL

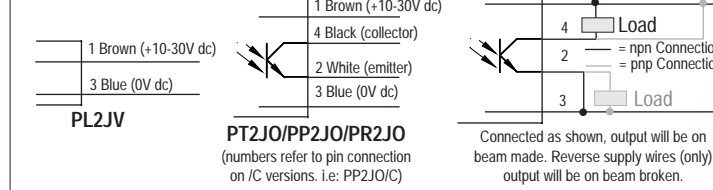
Supply	10-30V dc
Output	Fully protected, opto-isolated transistor. Rated@ 100mA 30V dc max.
Indication	Output state and variable intensity alignment
Termination	2M PVC sheathed cable or 4 pin connector
Sensitivity	0-100% on receiver, reflex and retro reflex

## SELECTION CHART

Model	Type	Operating Range	Weight
PP2JO	Retro Reflex	5.0M	280g
PP2JO/C	Retro Reflex	5.0M	100g
PR2JO	Reflex	0.75M	280g
PR2JO/C	reflex	0.75M	100g
PT2JO	Receiver	> 6.0M	280g
PL2JV	Emitter	> 6.0M	280g
PT2JO/C	Receiver	> 6.0M	100g
PL2JV/C	Emitter	> 6.0M	100g

Models with 'C' after type number require a connector.

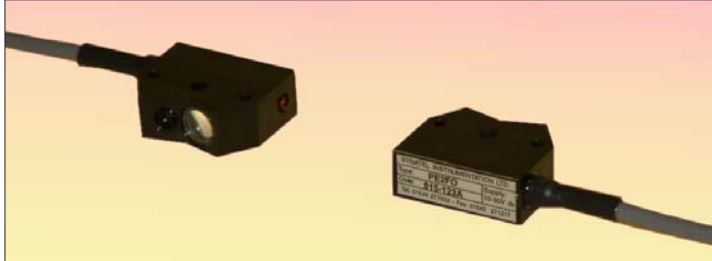
## Connections



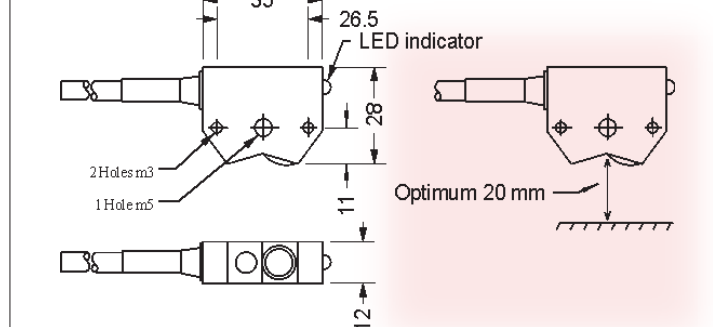
Accessories: Reflector, Connector with 2 metres cable (for use on connector 'C' versions only)

## MINIFLEX REFLEX SENSOR

Short range adaptable reflex sensors in infra red and visible light formats. These units are ideal for packaging and labelling machines where the focussed, short range operation prevents false signalling from nearby objects.



## Dimensions



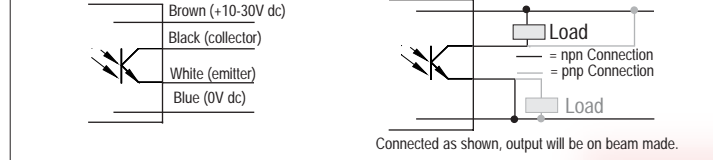
## SPECIFICATION - GENERAL

Supply	10-30V dc
Output	Fully protected, opto-isolated transistor. Rated@ 100mA 30V dc max.
Operating Range	0-0.05M max, 0.02M optimum
Indication	Output On LED
Termination	2M PVC sheathed cable

## SELECTION CHART

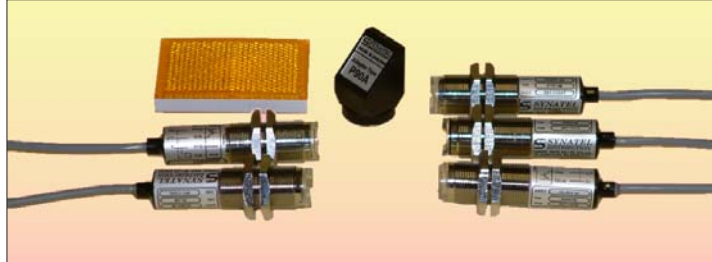
Model	Type	Weight
PE2FO	Visible red light suitable for most applications	100g
PI2FO	Infra-red sensor for dark, or black items	100g

## Connections

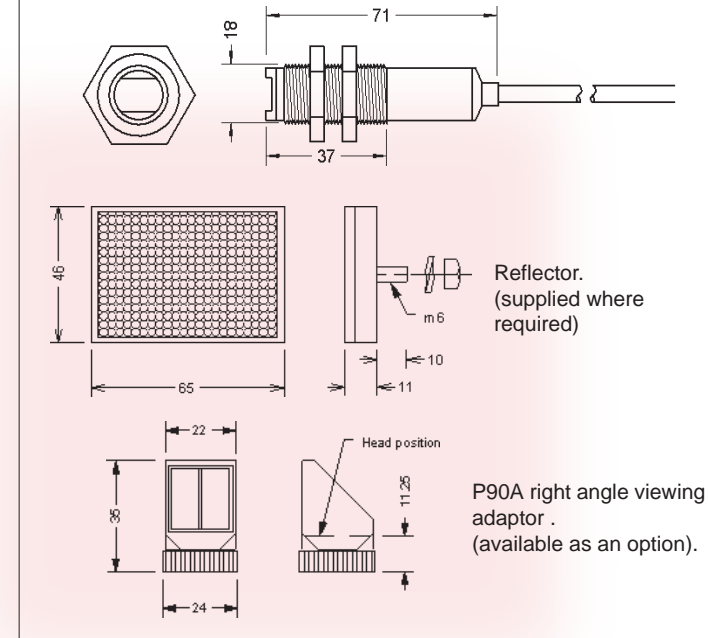


## OPTIBEAM RANGE

A range of 18mm sensors in through beam, non-polarised retro-reflex, polarised retro-reflex and reflex formats. These units provide a very cost effective solution to a wide range of different applications throughout industry.



## Dimensions



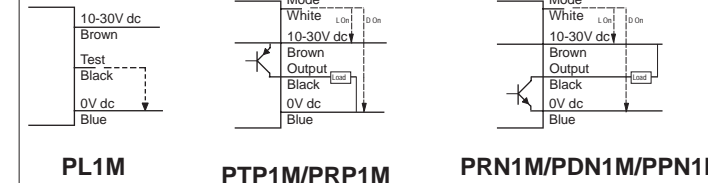
## SPECIFICATION - GENERAL

Supply	10-30V dc
Output	Fully protected, opto-isolated transistor. Rated@ 100mA 30V dc max.
Indication	Output state
Termination	2M PVC sheathed cable
Sensitivity	0-100% on receiver, reflex and retro reflex

## SELECTION CHART

Model	Type	Operating Range	Weight
PRN1M	Reflex npn	0.4M	100g
PRP1M	Reflex pnp	0.4M	100g
PDN1M	Retro-reflex npn	2.0M	100g
PPN1M (polarised)	Retro-reflex npn	1.0M	100g
PTP1M	Receiver pnp	> 8.0M	100g
PL1M	Emitter	> 8.0M	100g
P90A	Right angle viewing adaptor		20g

## Connections

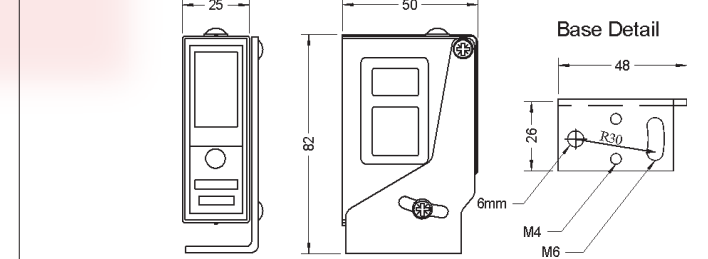


## OPTIBEAM RANGE

An economic range of robust sensors for dc and ac applications supplied as complete units with universal fixing brackets and reflectors (if needed). Operating ranges are: retro-reflex 4m distance, through beam 8m distance.



## Dimensions



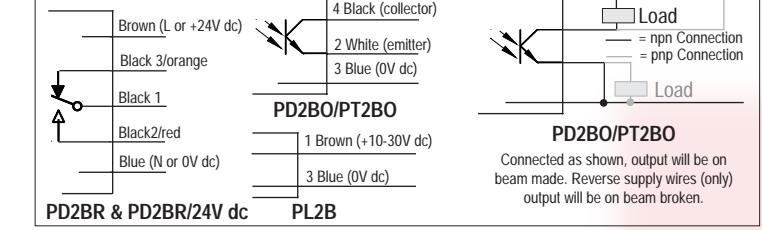
## SPECIFICATION - GENERAL

Supply	10-30V dc
Output	'O' units: Fully protected, opto-isolated transistor. Rated@ 100mA 30V dc max. 'R' units: S.P.C.O relay. Rated @ 3A 240V non-inductive
Indication	Output state LED
Termination	2M PVC sheathed cable
Mounting	Bracket supplied

## SELECTION CHART

Model	Type	Voltage Range	Weight
PD2BO	Retro-Reflex	10-30V dc	110g
PD2BR-24	Retro-reflex	24V dc	110g
PD2BR	Retro-reflex	90-260V ac	110g
PL2B	Through beam emitter	10-30V dc	110g
PT2BO	Through beam receiver	10-30V dc	110g

## Connections

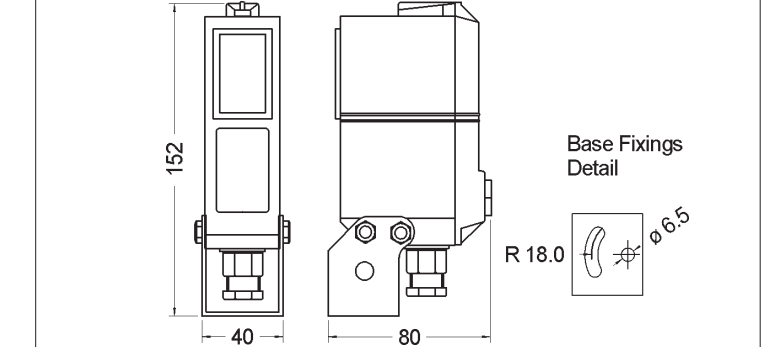


## UNILIGHT RANGE

A robust and heavy duty range of sensors, all with universal voltage power supplies, sensitivity controls and time delays. Available in through beam, polarised retro-reflex and background suppressed reflex formats. Units are complete with a universal mounting bracket.



## Dimensions



## SPECIFICATION - GENERAL

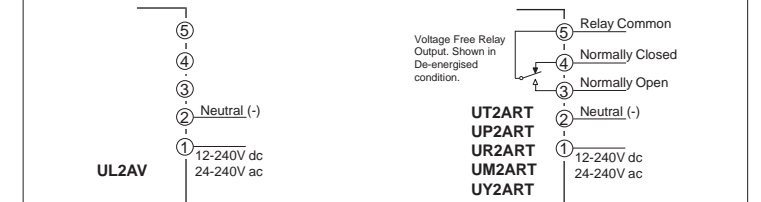
Supply	12-240V ac/dc
Output	S.P.C.O relay rated at 3A 240V ac max. non-inductive
Indication	Output state and variable intensity alignment
Sensitivity	0-100% on receiver, reflex and retro reflex
Time Delay	0-5 seconds on beam make and beam break

## SELECTION CHART

Model	Type	Operating Range	Weight
UP2ART	Retro-reflex	5.0M	280g
UR2ART	Reflex	0.75M	280g
UM2ART	Clear glass/plastic sensor retro-reflex	1.0M	280g
UT2ART	Receiver	> 8.0M	280g
UL2AV	Emitter	> 8.0M	280g
UY2ART	Background suppressed reflex	1.0M	280g

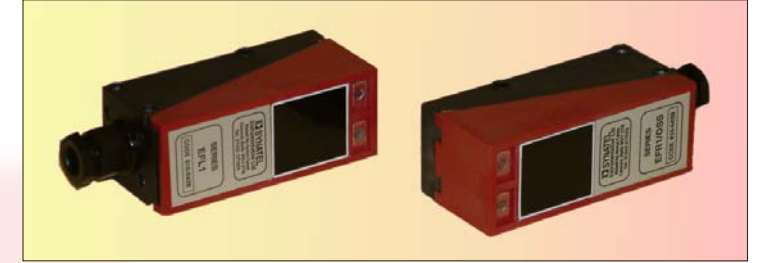
Accessories: Reflectors

## Connections

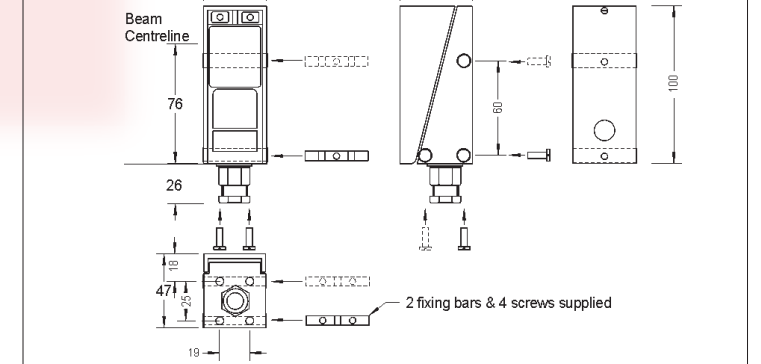


## EF RANGE

A set of through beam sensors, working on 24V dc supply. Quick disconnect, a single screw holds the units together and the cabling is via a plug-in screw terminal block. Units are complete with mounting bars.



## Dimensions



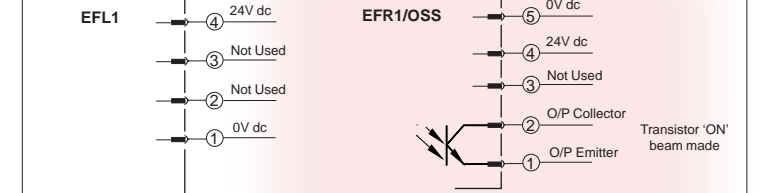
## SPECIFICATION - GENERAL

Supply	24V dc
Output	Opto-isolated protected transistor. 30V dc 100mA max rating. npn or pnp configurable.
Indication	Output state and variable intensity alignment
Sensitivity	N/A
Time Delay	N/A

## SELECTION CHART

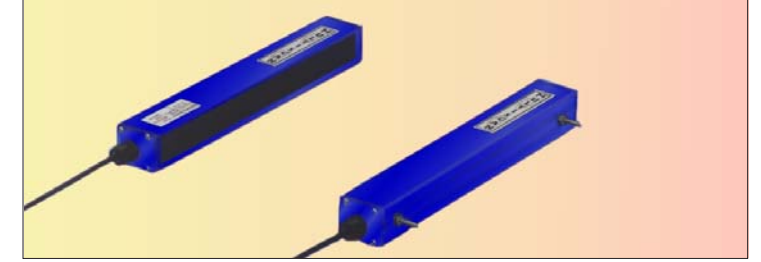
Model	Type	Operating Range	Weight
EFR1/OSS	Receiver	> 6.0M	200g
EFL1	Emitter	> 6.0M	200g

## Connections

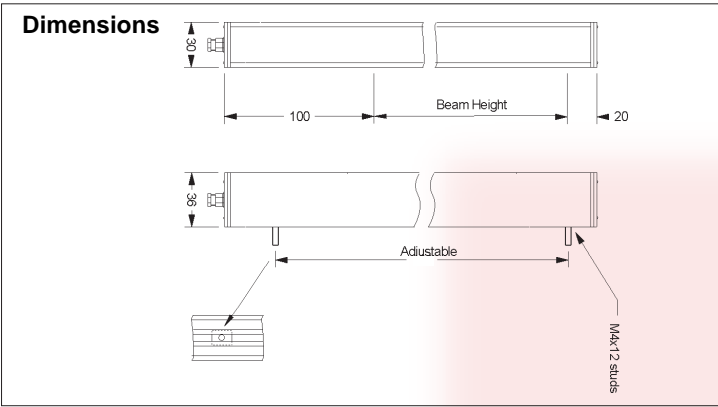


## MULTIBEAM RANGE

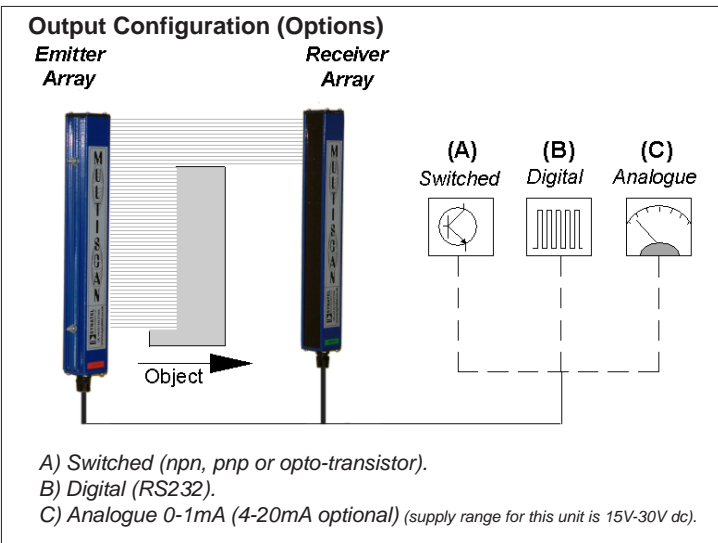
Versatile and adaptive through beam sensor arrays suitable for height or object detection anywhere within a specified light curtain. Output can be either analogue, digital or switched (transistor), or a combination to suit particular applications.





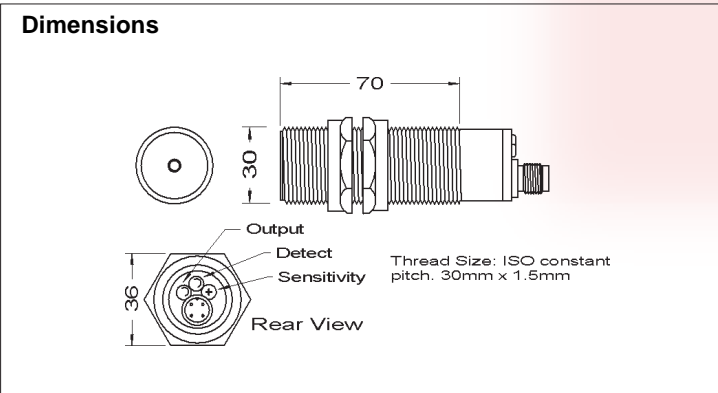


SPECIFICATION - GENERAL	
Supply	10-30V dc (15-30V dc analogue o/p units)
Output	Optional choice of: switched (npn, pnp or opto-transistor, digital RS232, analogue 0-1mA or 4-20mA)
Indication	Output state LED
Operating Range	100mm upto 2M max.
Beam Pitch	3mm
No. of Beams	30 standard, may be increased in multiples of 30
Mounting	M4 x 12mm adjustable fixing studs (supplied)

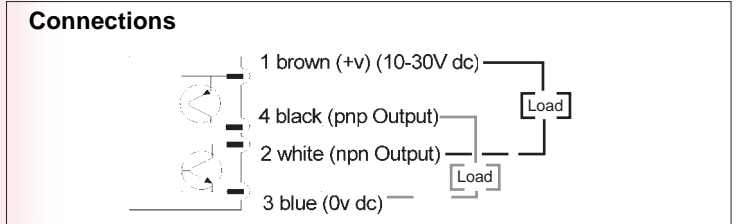


**PB1TS2/C Sensor**

This is a broad beam sensor and is typically used on bottling lines, and will work with either glass or plastic containers. The sensor will ignore small gaps between bottles etc.



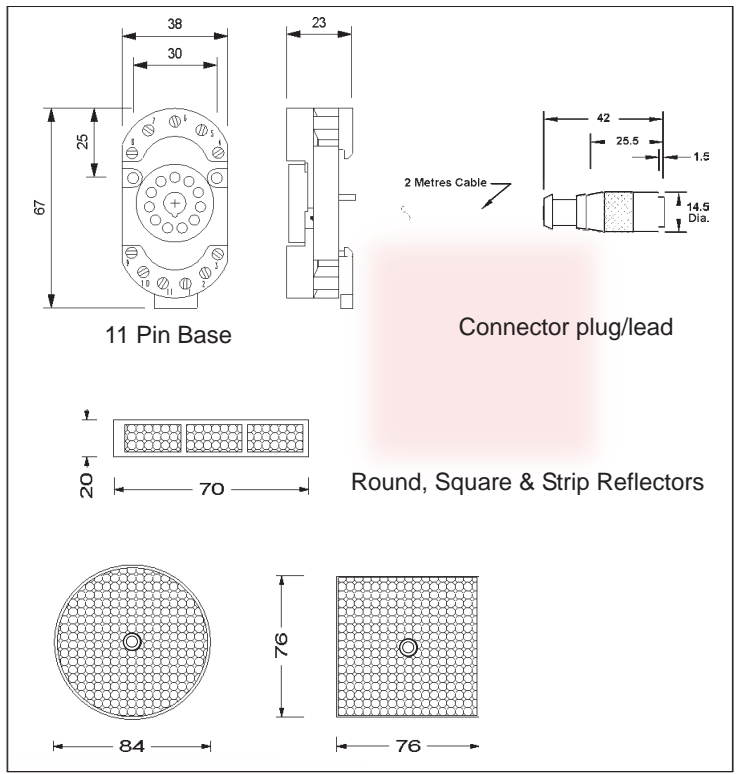
SPECIFICATION - GENERAL	
Supply	10-30V dc
Output	1 npn > Rated @ 30V dc 1 pnp > 100mA max.
Indication	Output state and Detect LED's
Sensitivity	Adjustable 0-100%
Weight	120g



Accessories: Connector

**ACCESSORIES**

A range of ancillary items for use with specified synatel units.



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 Web: www.synatel.co.uk  
 e-mail: sales@synatel.co.uk

UKAS QUALITY MANAGEMENT 001

photoelectric sensors



proximity sensors



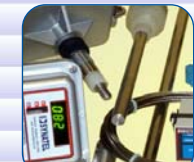
speed monitors



counters & tachometers



level control sensors



special systems



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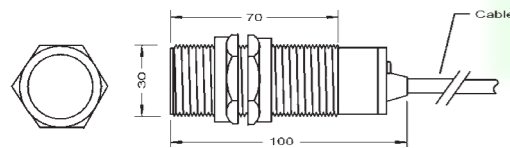
## CAPACITIVE SENSORS

30mm diameter enclosures, multivoltage supply with relay output or 2 wire FET output versions.

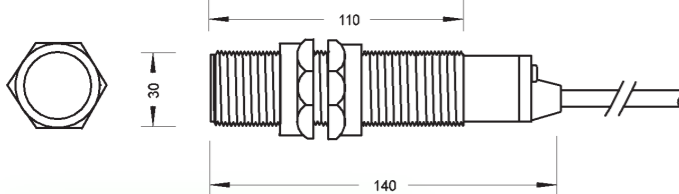


### Dimensions

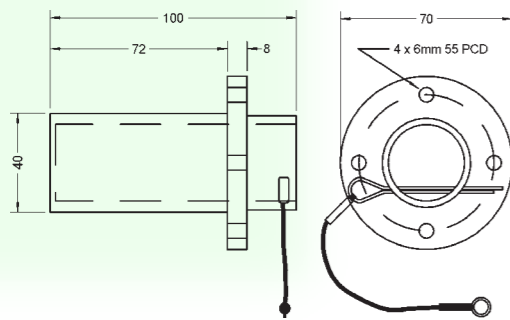
CD1TR(A) - CE1TR(A)  
CD1TZ(A) - CE1TZ(A)



### UC1TR

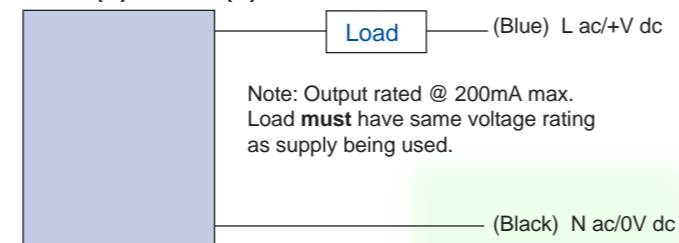


Optional extra available:  
**Mounting Pocket:** (not for use with UC1TR)  
**Material:** Polypropylene.  
**Weight:** 70g.



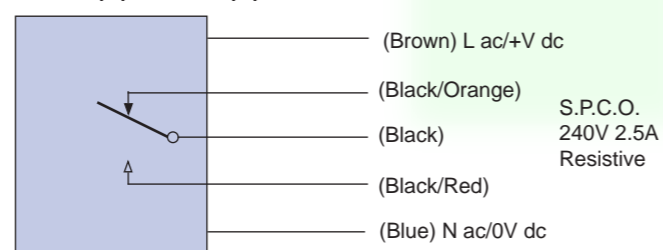
### Connections

CD1TZ(A) - CE1TZ(A)



Note: Output rated @ 200mA max.  
Load **must** have same voltage rating as supply being used.

CD1TR(A) - CE1TR(A)



'D' variation sensors CD1T#(A) output **ON** when sensing.  
'E' variation sensors CE1T#(A) output **OFF** when sensing.

2 wire units C#1TZ(A): supply voltage is 24-240V ac/dc.  
5 wire units C#1TR(A): supply voltage is 12-24V ac/24-240V dc.

C#1T#(A) ATEX category: Ⓜ II 1D (Zone 20).

### SPECIFICATION - GENERAL

	UC1TR
Supply	12-240V dc/24-240V ac.
Output	SPCO relay
Output Rating	2.5A 240V ac maximum. Non-inductive.
Output State	Programmable
Operating Range	25mm Typical.
Hysteresis	15% of Operating range.
Ambient Temp.	-15°C to +50°C.
IP Rating	IP65.
Number of cores	5
Weight	260g

### SPECIFICATION - GENERAL

	CD1TR(A)	CE1TR(A)	CD1TZ(A)	CE1TZ(A)
Supply	12-240V dc/24-240V ac.		24-240V ac/dc	
Output	SPCO relay		2 wire FET	
Output Rating	2.5A 240V ac maximum. Non-inductive.		200mA maximum.	
Output State	Normally OFF	Normally ON	Normally OFF	Normally ON
Operating Range	25mm Typical.			
Hysteresis	15% of Operating range.			
Ambient Temp.	-15°C to +50°C.			
IP Rating	IP65.			
Number of cores	5		2	
Weight	325g		300g	

Note: To prevent damage to units, 2 wire sensors **MUST** be wired in series with a load/relay/contact and **NOT** directly across supply being used.

## PROXIMITY SENSOR CATALOGUE

2

### photoelectric sensors



### proximity sensors



### speed monitors



### counters & tachometers



### level control sensors



### special systems



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## PROXIMITY SENSOR RANGE

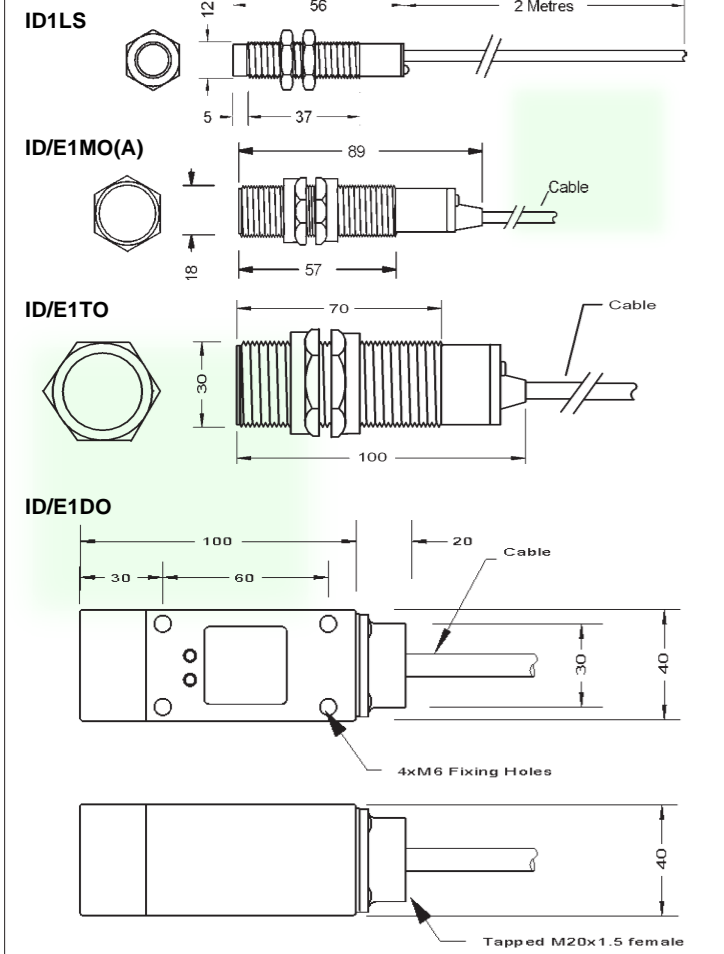
Synatel manufacture a range of proximity sensors, both inductive and capacitive, in a variety of enclosures ranging from a 12mm diameter dc type upto a 40mm DIN standard limit switch style; multivoltage with relay output. Units are available with ATEX and IEC Ex certification.

## DC INDUCTIVE SENSORS

Consists of 12. 18, 30mm dia. plus DIN standard limit switch style. All units work from 10-30V dc supplies and provide transistor output for signalling/control purposes.



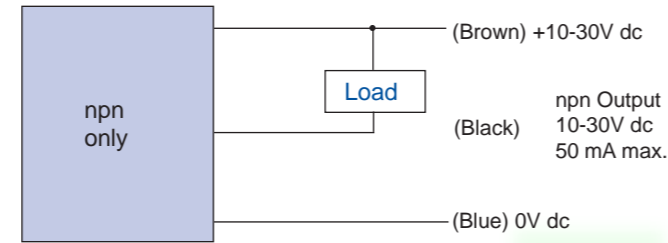
### Dimensions



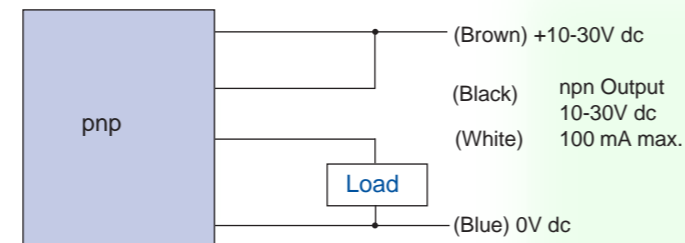
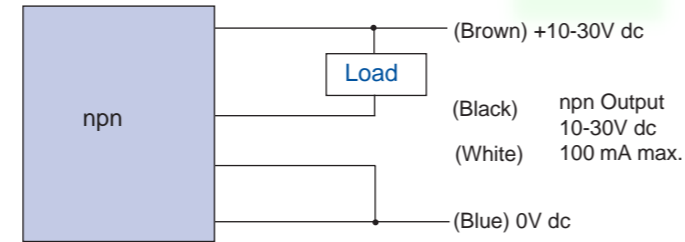
SPECIFICATION - GENERAL				
	ID1LS (12mm)	ID/E1MO(A) (18mm)	ID/E1TO(A) (30mm)	ID/E1DO (Limit Switch)
Supply	10-30V dc.			
Output	nnp transistor.	Fully opto-isolated transistor, reverse and overvoltage protected. nnp/pnp configureable.		
Output Rating	30V 50mA max.	30V 100ma Max.		
Output State	Normally OFF.	User selectable.		
Operating Range	4mm	8mm	12mm	
Hysteresis	15% of Operating range.			
Ambient Temp.	-15°C to +50°C.			
IP Rating	IP65.			
Number of cores	3	4 (2 cores connect together to give nnp or pnp connection).		
Weight	75g	260g	300g	325g

Note: ID/E1MO(A) is also available with Gas Hazard approval -unit becomes ID/E1MO(AG). Suitable for gas group 2B. Supply **must** be fused (see manual supplied with unit). All other details are as stated above.

### ID1LS



### ID/E1MO(A) - ID/E1TO - UD1DO



With 4 wire units **connected as shown** above, **output** will be **ON** when unit is **sensing**. For **output OFF** when **sensing**, **reverse supply wires** (only).

ID/E1MO(A) ATEX category: Ⓜ II 1D (Zone 20).  
ID/E1MO(AG) ATEX category: Ⓜ II 2G 1D EEx m IIB (Zone 0/20).

Sensor attachment accessory available (Whirligig).  
Targets are fully protected, no further guarding required.  
See Speed Monitoring Catalogue (Section 3), for details.

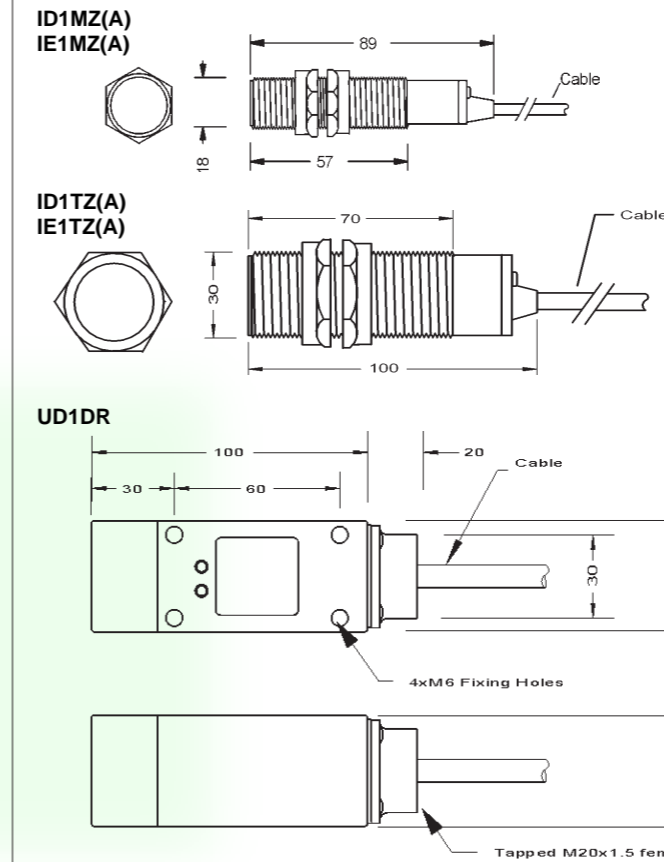
All dimensions shown in mm unless otherwise specified.

## MULTI-VOLTAGE INDUCTIVE SENSORS

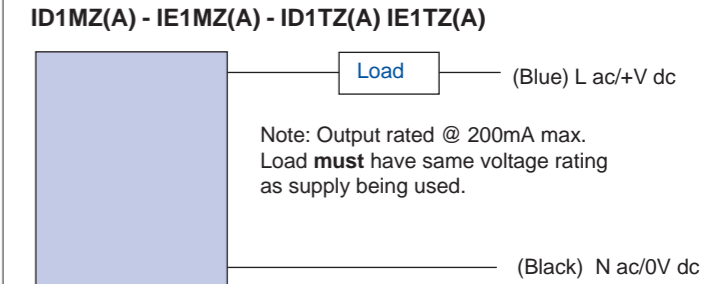
Consists of 18 and 30mm, 2 wire versions (24-240V ac/dc), plus DIN standard limit switch package (12-240V dc/24-240V ac) with relay output.



### Dimensions

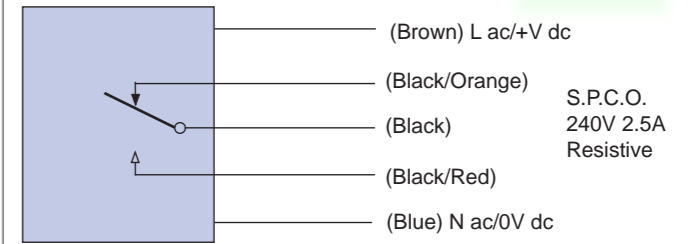


### Connections



'D' variation sensors ID1#Z(A) output **ON** when **sensing**.  
'E' variation sensors IE1#Z(A) output **OFF** when **sensing**.

### UD1DR



2 wire units: supply voltage is 24-240V ac/dc.  
5 wire units: supply voltage is 12-24V ac/24-240V dc.

I#1MZ(A) ATEX category: Ⓜ II 1D (Zone 20).  
I#1MZ(AG) ATEX category: Ⓜ II 2G 1D EEx m IIB (Zone 0/20).

Sensor attachment accessory available (Whirligig).  
Targets are fully protected, no further guarding required.  
See Speed Monitoring Catalogue (Section 3), for details.

### SPECIFICATION - GENERAL

	ID1MZ(A)-IE1MZ(A) (18mm)	ID1TZ(A)-IE1TZ(A) (30mm)	UD1DR Limit switch
Supply	24-240V ac/dc.		12-240V dc/24-240V dc.
Output	2 wire FET.		SPCO relay.
Output Rating	200mA maximum.		2.5A 240V ac maximum Non-inductive.
Output State	'D' normally OFF, 'E' normally ON.		Normally OFF.
Operating Range	8mm	12mm	
Hysteresis	15% of Operating range.		
Ambient Temp.	-15°C to +50°C.		
IP Rating	IP65.		
Number of cores	2		5
Weight	260g	300g	325g

Note: To prevent damage to units, 2 wire sensors **MUST** be wired in series with a load/relay/contact and **NOT** directly across supply being used.

Note: ID1MZ(A) & IE1MZ(A) are also available with Gas Hazard approval -units becomes I#1MZ(AG). Suitable for gas group 2B. Supply **must** be fused (see manual supplied with unit). All other details are as stated above.

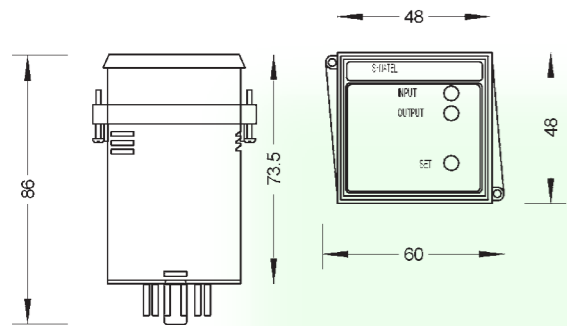


## MODUSLIP UNDERSPEED RMR48/T

An underspeed module in a 48mm DIN standard enclosure, can also be used for overspeed detection. Single pushbutton calibration for set running speed and start up delay.



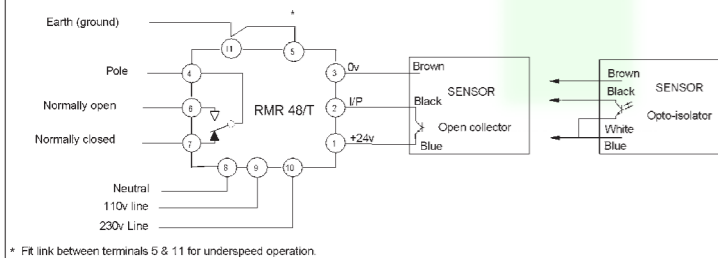
### Dimensions



### SPECIFICATION - GENERAL

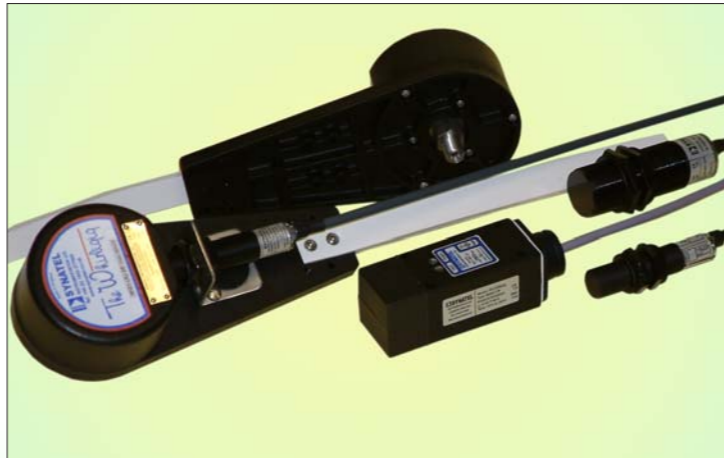
Supply	110/230V ac 50/60Hz.
Operating Temp	-10°C to +50°C.
Operating Speed	1-10,000 PPM.
I.P. Rating	IP40.
Operating Distance	Dependant upon sensor used.
Output	S.P.C.O Relay. 5A 240V ac maximum.
Output State	Output energised @ set running speed, de-energises if rotation falls 20% or more below set speed.
Calibration	Start-up delay and set running speed user programmable via pushbutton.
Start-Up Delay	Programmable start-up delay. Output energises for time period irrespective of incoming pulse signal, allows machinery to achieve running speed. Max. 30 seconds.
Indication	LED indication of input pulses and output energised.
Input Device	npn transistor or contact input. Any Synatel dc inductive proximity sensor is suitable.
Weight	210g.

### Connections



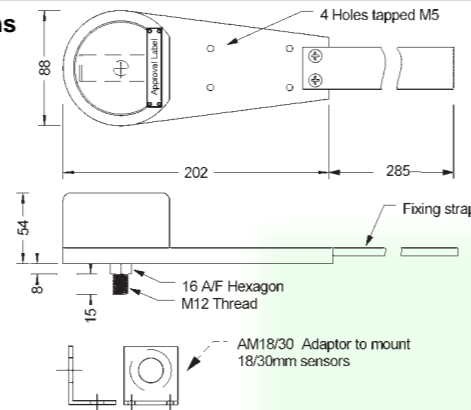
## WHIRLIGIG SPEED MONITORING ATTACHMENT

A low cost, fully contained speed monitoring attachment, allowing easy fitting of all Synatel 18/30mm and DIN standard limit switch style proximity sensors/ speed monitors. Simple M12 fixing. Targets are fully enclosed and require no further guarding. ATEX approved.



Whirligig ATEX category:  $\text{II}$  1GD c (Zone 0/20).

### Dimensions



### SPECIFICATION - GENERAL

Fixing	M12 x 1.75mm pitch stainless steel stud.
Mechanical Fitting	Reinforced flexible strap. Attach to static part of installation.
Bearing	Single deep groove stainless steel ball race. Sealed for life.
Body Material	Moulded Co-polymer.
Other Parts	Stainless Steel.
Maximum Speed	500 RPM.
Targets	2 pulses per revolution, (PPR) as standard. 1, 4 or 8 pulses available as an option.
Weight	410g.

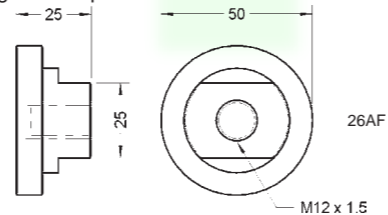
### Also Available

Ideal for use in existing installations where it may not be possible to drill shaft end, or for temporary speed monitoring applications.

Weight: 280g.

### MAGCON

Rare earth magnetic WG1 fixing. No drilling required. Simply screw the WG1 unit onto the magcon and place on end of shaft.



## SPEED MONITORING CATALOGUE

3

### photoelectric sensors



### proximity sensors



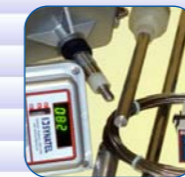
### speed monitors



### counters & tachometers



### level control sensors



### special systems



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e-mail: [sales@synatel.co.uk](mailto:sales@synatel.co.uk)



## SPEED MONITORING RANGE

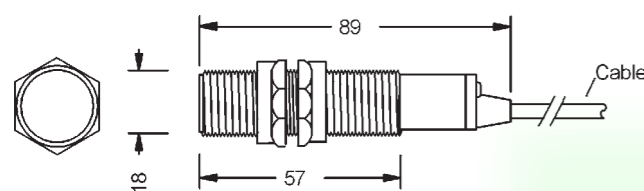
A range of stopped motion, over or underspeed monitors, designed and manufactured in the UK by Synatel, available as self contained units or in modular form with separate proximity sensors. ATEX/IEC Ex units available for hazard areas.

## ROTASTOP STOPPED MOTION SU1MZ(A)

An 18mm dia unit, fully self contained, incorporating a proximity sensor and associated stopped motion circuitry. The unit detects a stud on a shaft and the output maintains it's 'on' state whilst the target is moving. Ideal for chain & gear driven shafts. For belt driven applications see PU1TZ(A)/PU1TR(A).



### Dimensions



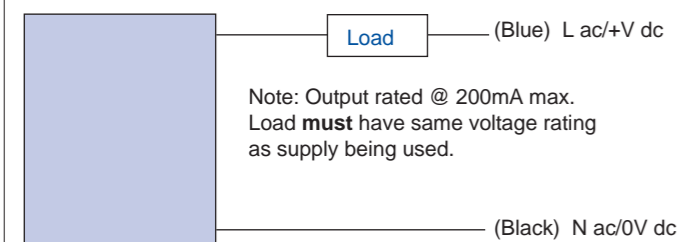
### SPECIFICATION - GENERAL

Supply	24-240V ac/dc.
Operating Temp	-15°C to +50°C.
Operating Speed	15-3600 PPM.
I.P. Rating	IP65.
Operating Distance	8mm max (ferrous target - 18mm dia. min.)
Output	Two wire FET. Maximum. current 200mA. Vdrop= 8V maximum.
Output State	Output ON (energised) while shaft running and at least one pulse received within every 4 second.
Time Delay	4 seconds. Output de-energises after this time period if no input is detected. Alternative delays available.
Start-Up Delay	On application of supply. Output energises for 4 seconds to allow machinery to achieve normal running speed.
Indication	LED indication of input pulses and output energised.
Weight	260g.

Note: **SU1MZ(A)** is also available with Gas Hazard approval - unit becomes **ID/E1MO(AG)**. Suitable for gas group 2B. Supply **must** be fused (see manual supplied with unit). All other details are as stated above.

### Connections

2 wire SU1MZ(A) & PU1TZ(A) units

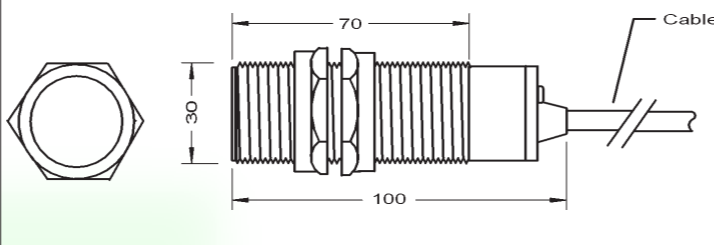


## ROTASLIP UNDERSPEED PU1TZ(A)/PU1TR(A)

A 2 wire, FET output - PU1TZ(A) or a 5 wire, relay output - PU1TR(A) underspeed sensor. The unit detects a stud or bolt on a shaft and indicates a fault condition if input speed falls by 20% or more below set running speed.



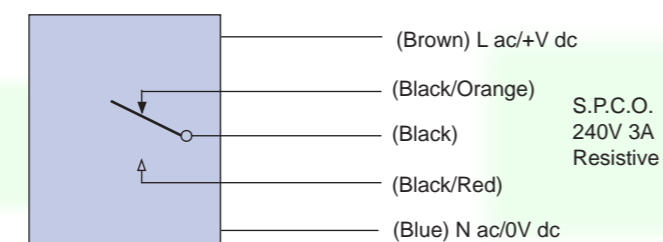
### Dimensions



### SPECIFICATION - GENERAL

Supply-PU1TZ(A)	24-240V ac/dc.
Supply-PU1TR(A)	12-240V dc/24-240V ac
Operating Temp	-15°C to +50°C.
Operating Speed	10-3600 PPM.
I.P. Rating	IP65.
Operating Distance	12mm max (ferrous target - 25mm dia. min.)
Output-PU1TZ(A)	Two wire FET. Maximum current 200mA. Vdrop = 8V maximum.
Output-PU1TR(A)	S.P.C.O relay. 3A 240V ac max. Non-inductive.
Output State	Output energised @ set running speed, de-energises if rotation falls 20% or more below set speed.
Calibration	Start-up delay and set running speed user programmable using a magnet (supplied) applied to a target area on body of sensor. Automatically calibrates to 20% under normal running speed.
Start-Up Delay	Programmable start-up delay. Output energises for time period irrespective of incoming pulse signal, allows machine to achieve running speed. Max. 30 seconds.
Indication	LED indication of input pulses and output energised.
Weight	300g.

5 wire PU1TR(A) units



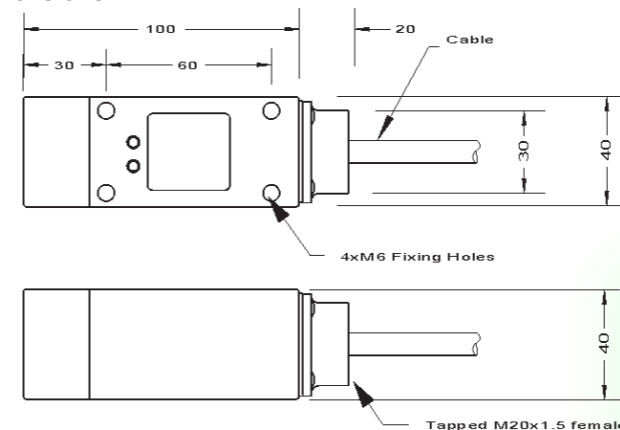
All dimensions shown in mm unless otherwise specified.

## ROTAMATIC UNDERSPEED PU1DR(A)

A DIN standard limit switch packaged underspeed monitor with relay output. Output given if input speed falls by 20% or more below set running speed.



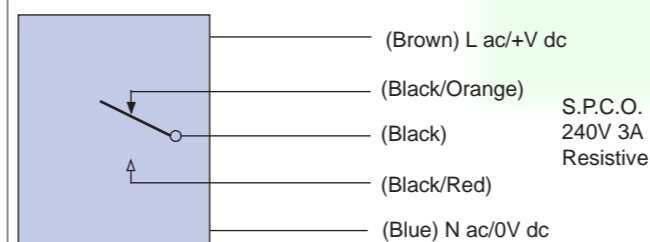
### Dimensions



### SPECIFICATION - GENERAL

Supply	12-24V dc/24-240V ac.
Operating Temp	-15°C to +50°C.
Operating Speed	10-3600 PPM.
I.P. Rating	IP65.
Operating Distance	12mm max (ferrous target - 25mm dia. min.)
Output	S.P.C.O Relay. 3A 240V ac maximum.
Output State	Output energised @ set running speed, de-energises if rotation falls 20% or more below nominal speed.
Calibration	Start-up delay and set running speed user programmable using a magnet (supplied) applied to a target area on body of sensor. Automatically calibrates to 20% under normal running speed.
Start-Up Delay	Programmable start-up delay. Output energises for time period irrespective of incoming pulse signal, allows machine to achieve running speed. Max. 30 seconds.
Indication	LED indication of input pulses and output energised.
Weight	500g.

### Connections

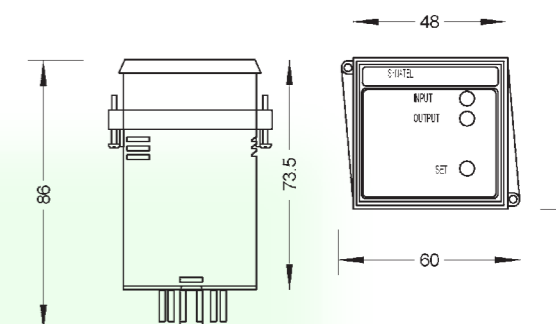


## MODUSTOP STOPPED MOTION LSM48

Non contact, solid state unit. 48mm din standard enclosure, adjustable input signal time delay with relay output. Ideal for gear & chain driven applications. See RMR48/T for belt driven applications.



### Dimensions

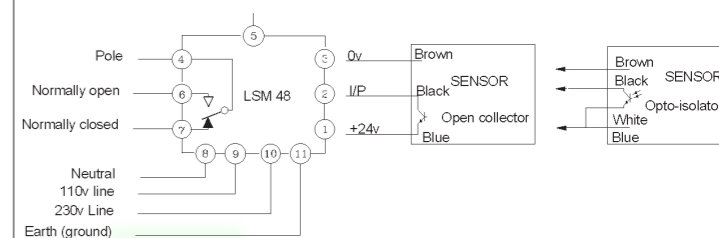


### SPECIFICATION - GENERAL

Supply	110/230V ac 50/60Hz.
Operating Temp	-15°C to +50°C.
Operating Speed	1-10,000 PPM.
I.P. Rating	IP40.
Operating Distance	Dependant upon sensor used.
Output	S.P.C.O Relay. 5A 240V ac maximum.
Output State	Output energised providing at least on input pulse is received within time period set on top plate of module. Output de-energises if no pulse received within time period.
Calibration	Adjustable potentiometer sets input delay.
Start-Up Delay	Output energises for set time period and ignores incoming pulse signal, allowing machinery to reach running speed.
Indication	LED indication of input pulses and output energised.
Input Device	npn transistor or contact input. Any Synatel dc inductive proximity sensor is suitable.
Weight	210g.

Note: Standard input time delay is **1.5-15 seconds**. Other time periods available to order are: **0.3-3 seconds, 3-30 seconds or 6-60 seconds**.

### Connections



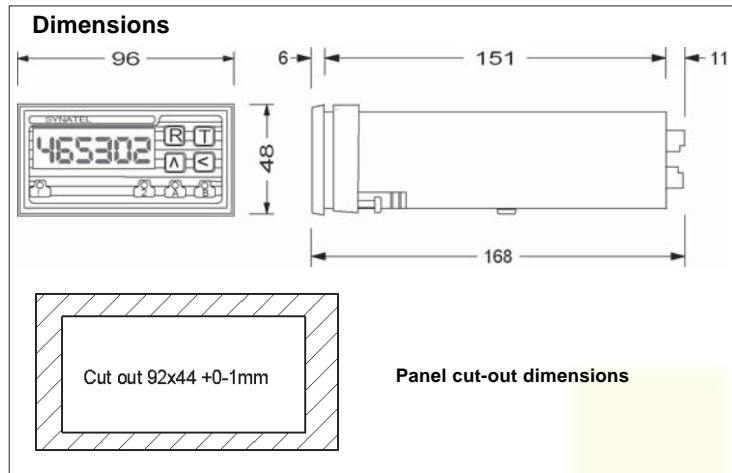


## COUNTER AND TACHOMETER DISPLAYS

Synatel manufacture and supply a range of digital display units suitable for applications including: counting, batching, totalising or speed indication purposes. Units either have a panel cut-out of 96 x 48mm or 144 x 72mm (DIN standard).

## CUL1/CUL1R COUNTER/TACHOMETER

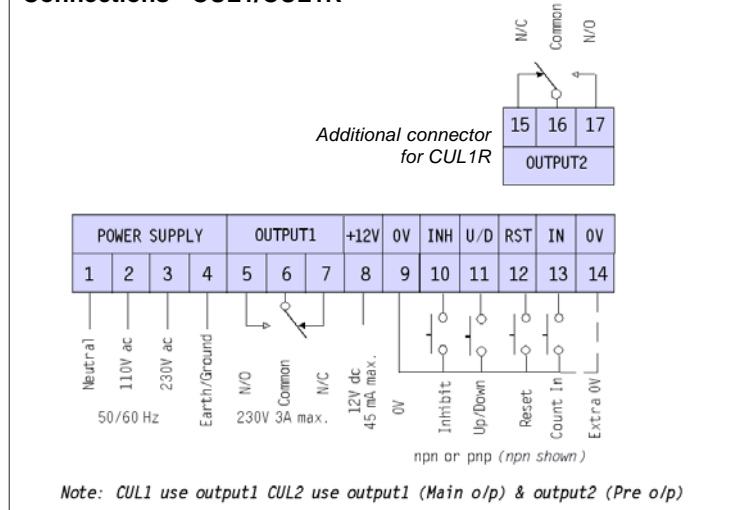
Multi function unit with relay outputs can be user programmed as a counter, tachometer or dwell timer. High brightness vacuum fluorescent display. NPN, PNP or contact input, speeds up to 10KHz.



### SPECIFICATION - GENERAL

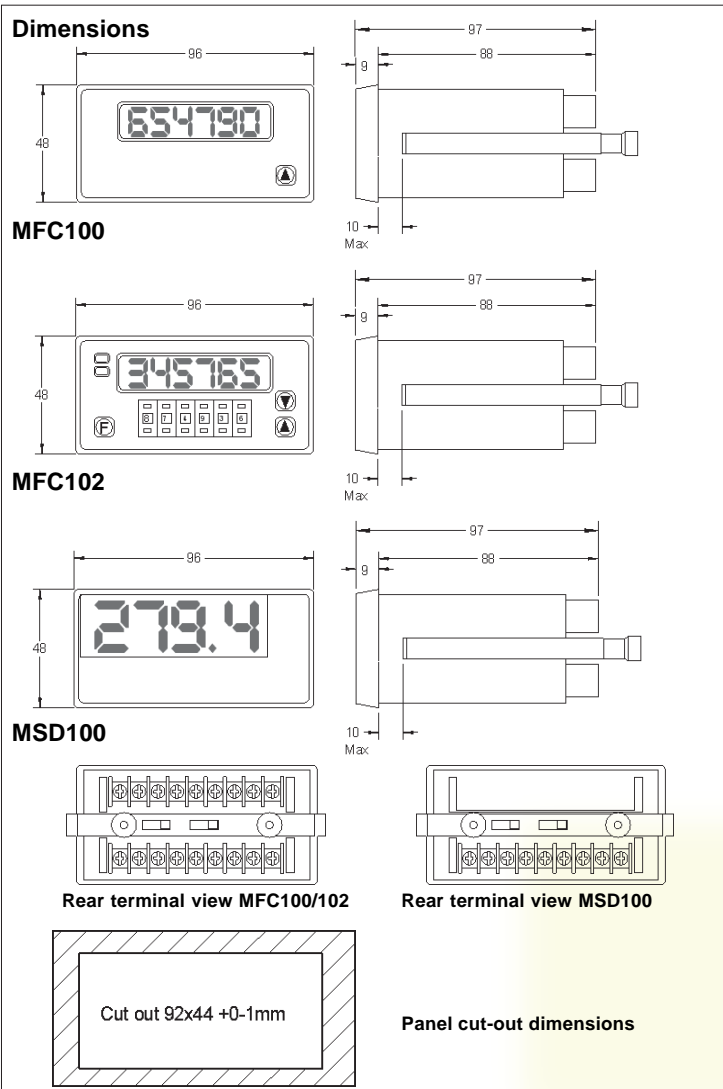
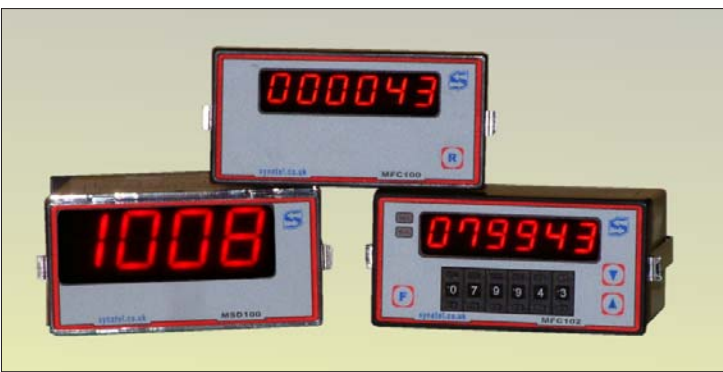
Supply	110/230V ac or 10-30V dc as specified.
Consumption	3VA.
Sensor Supply	12V dc smoothed, unswitched 45mA max.
Input	NPN, PNP or volt free contact.
Input Speed	10KHZ Max.
Output-CUL1	SPCO relay rated @ 5A ac non-inductive.
Output-CUL1R	2 x SPCO relay rated @ 5A ac non-inductive.
Programming	Via front panel pushbutton membrane.
Memory Retention	10 year memory of programme settings
Protection	IP41.
Connection	Plug-in screw terminals on rear of unit.
Weight	400g.

### Connections - CUL1/CUL1R



## MFC100/102 - MSD100 COUNTER/TACHOMETER

The 'Multicount' series are a highly cost effective range of digital displays which can be user programmed for counting, batching, speed display or dwell/bake time indication.



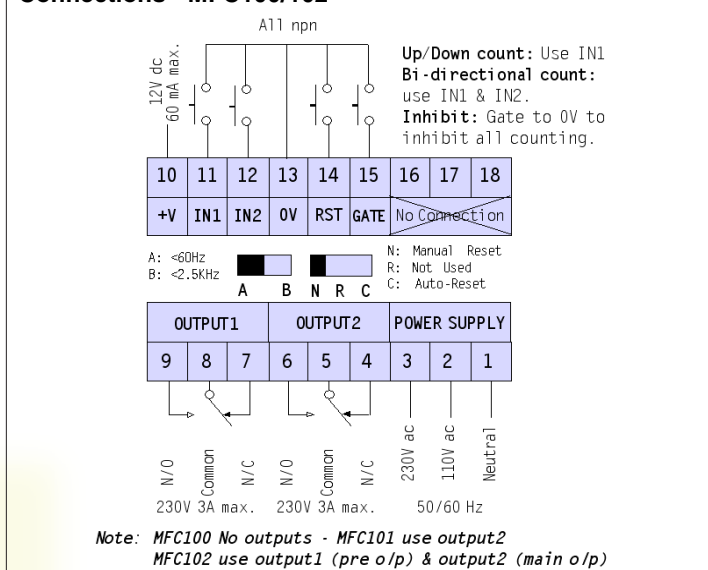
### SPECIFICATION - GENERAL

Supply	110/230V ac.
Consumption	3VA.
Sensor Supply	12V dc smoothed, 60mA max.
Input	NPN or volt free contact.
Input Speed	2.5KHZ Max.
Output-MFC100	None.
Output-MFC102	2 x SPCO relay rated @ 5A ac non-inductive.
Output-MSD100	SPCO relay rated @ 5A ac non-inductive. Can be used for underspeed control applications etc.
Programming	Via front panel pushbuttons, slide switches and rotary switch.
Memory Retention	10 year memory of programme settings
Protection	IP41.
Connection	Screw terminals on rear of unit.
Weight	400g.

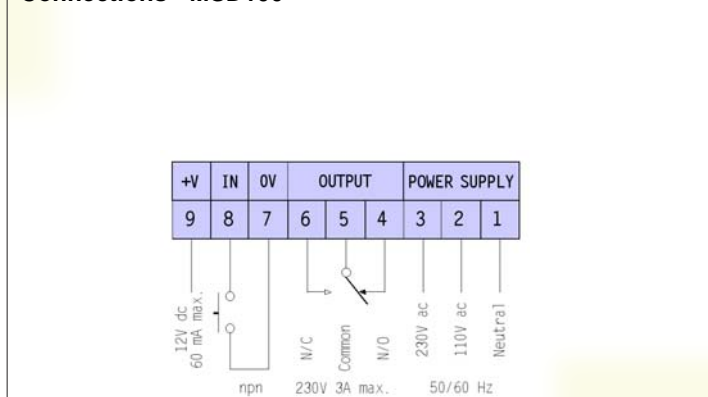
### Variations available are:

**MFC100** - Totalising counter, 6 digits, programmable divide/multiply function. Auto or manual reset.  
**MFC102** - Twin relay output, suitable for batching, slowdown and stop control etc. 6 digits. Programmable.  
**MSD100** - Tachometer or dwell time/bake time indication. 4 digits. Auto-adjusting floating decimal point. Relay output which can be used for underspeed signalling.

### Connections - MFC100/102



### Connections - MSD100

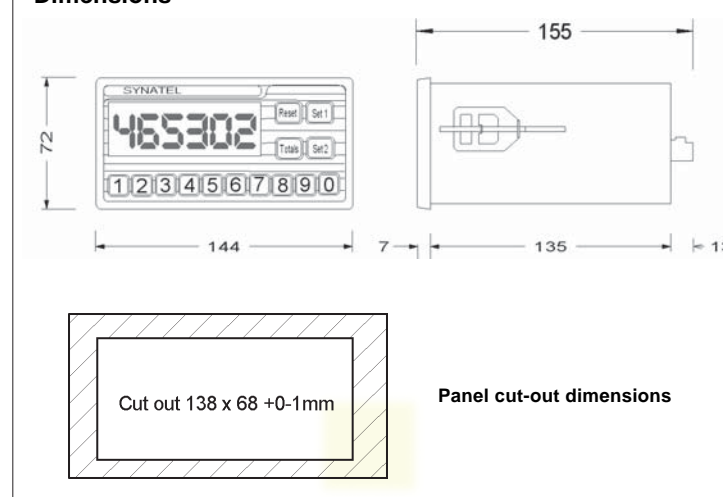


## SLIC - SPECIAL FUNCTION

Non-standard, special function counter/tachometer unit with special input and/or output configuration. Digital or analogue input capability. Relay, opto-isolated transistor or analogue outputs with RS232 communication facility. High brightness vacuum fluorescent display.



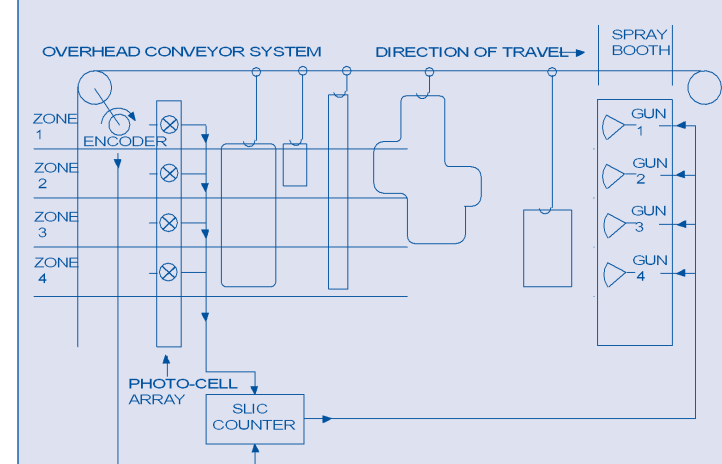
### Dimensions



### SPECIFICATION - GENERAL

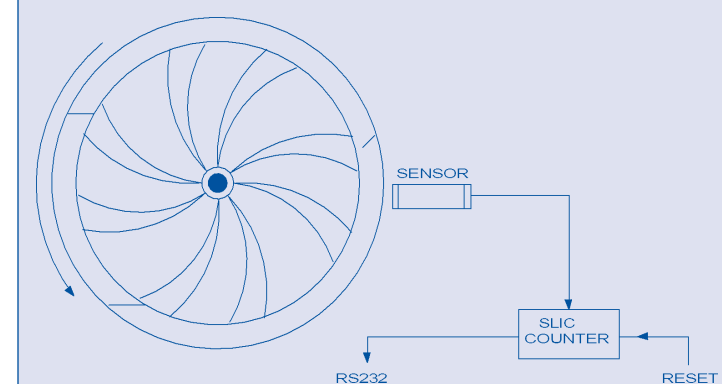
Units can contain a selection of the following specifications:	
Supply	110/230V ac plus a selection of dc supplies.
dc Supply Out	24V output available when mains powered. Reverse and over-volt protected.
Inputs	6 circuits, referenced to 24V dc supply. 2 optionally connected as a quadrature decoder. Fast/Slow response selectable (common control). pnp/npn selectable (common control). ESD protected.
Outputs	4 x Normally open relay contacts, 5A 240V ac non-inductive maximum.
Keyboard	Membrane, 14 keys, 0-9, Reset, Totals, Set1 & Set 2.
General	Power fail detection with battery back-up, sufficient for at least 1 month.
Protection	IP41.
Connection	Screw terminals on rear of unit.
Weight	530g.

## Application Examples



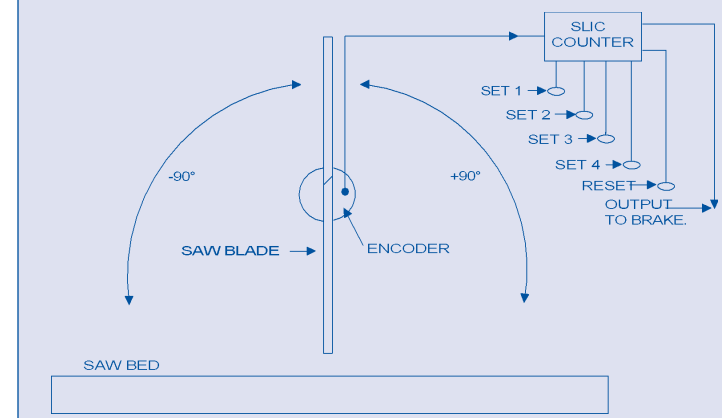
### Spray Control System

The object is to spray each item using guns 1-4 as appropriate, wasting as little paint as possible. Items are detected by photo-cells which must be mounted outside the spray booth and the SLIC records the number of encoder pulses for which the item is detected. This information transfers into a shift register which tracks the item from the photo-cell to the spray guns to spray the object. Facilities are incorporated to over or underspray the object if necessary.



### Gyro Test Unit

The Turbine is run up to a specific speed of 1400 RPM and then allowed to free wheel. The unit displays speed and when the speed falls to 11000 RPM it switches to displaying lapsed time. When the speed falls to 800RPM the time is displayed until the next test sequence. An RS232 output is provided for analysis by computer.

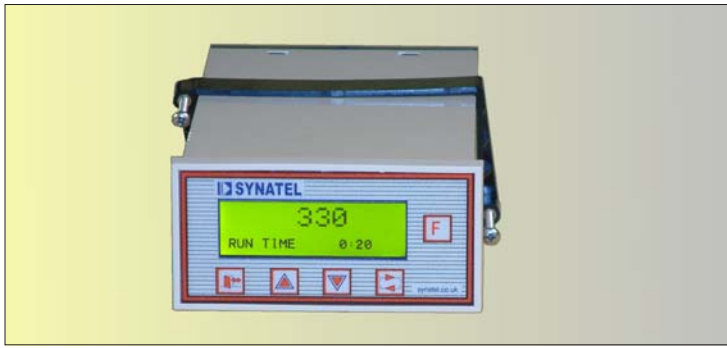


### Saw Angle Controller

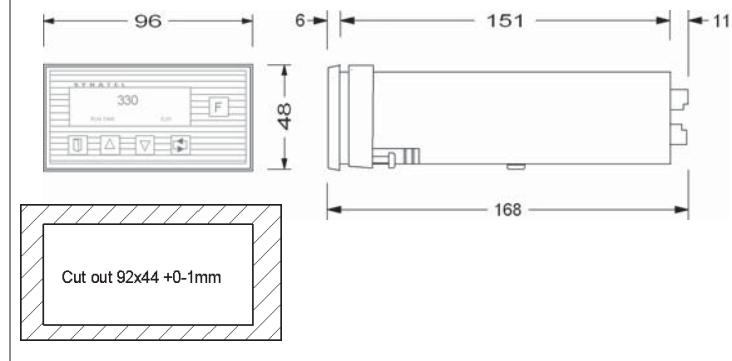
The SLIC displays the angular position of the saw and provides an output to apply a brake at one of four preset settings. The presets are set on the SLIC which displays to an accuracy of 0.1. An adjustable dead band can be incorporated. The reset resets the display to 90.0 which then reads + and - zero to 90.0 dependent upon the direction of rotation. The display is scaleable to suit any encoder.

## CTU1/CTU2 WITH GRAPHICS PANEL

Special function counter/tachometer unit with alpha-numeric graphic panel (back lit), ideal for displaying measured units or alert/warnings if signals go outside set parameters. Programming socket incorporated on rear of unit.



### Dimensions



### SPECIFICATION - GENERAL

Units can contain a selection of the following specifications:

Supply	110/230V ac 10-30V dc.
dc Supply Out	24V output available when mains powered. Reverse and over-volt protected.
Inputs	3 circuits, referenced to 24V dc supply. Fast/Slow response selectable (common control). pnp/npn selectable (common control). ESD protected. 10KHz true quadrature. Bi-directional counting.
Outputs	SPCO relay contacts, 5A 240V ac non-inductive maximum. Optically isolated 100mA @ 350V ac/dc (1500V isolation). Additional auxilliary board can be fitted for extra relay outputs, 4-20mA loop etc.
Display	Backlit LCD, 122 x 32 pixel, large and small character set.
Keyboard	Touch sensitive, 5 keys with bleeper.
Communication	RS232 input/output
General	Power fail detection with battery back-up, sufficient for at least 1 month.
Protection	IP41.
Connection	Screw terminals on rear of unit.
Weight	420g.

Connections will depend upon final function of unit.

### photoelectric sensors



### proximity sensors



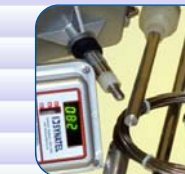
### speed monitors



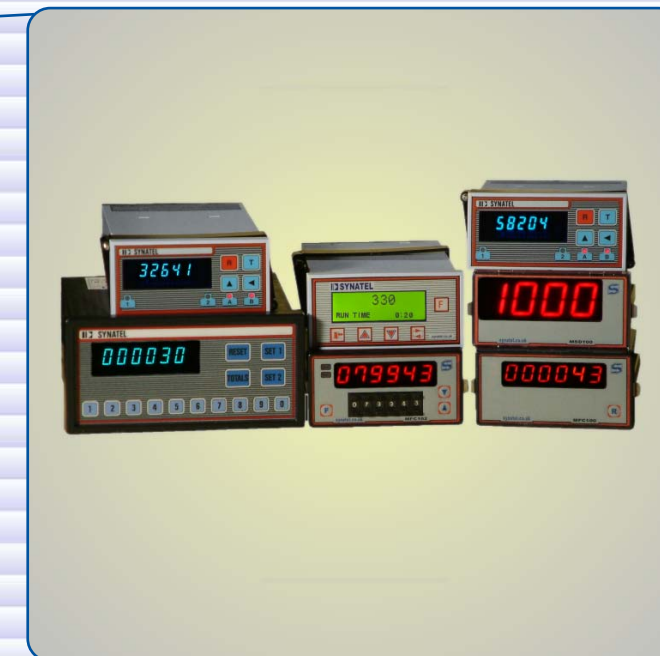
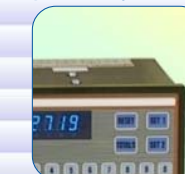
### counters & tachometers



### level control sensors



### special systems



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## LEVEL CONTROL RANGE

Synatel manufactures a range of level control equipment, both R.F capacitive and resistive, for use in most liquid and solid level sensing applications. Units are available with ATEX and CSA certification.

## DIGIMATIC SELF CONTAINED CAPACITANCE DML4(A)

Fixed point capacitive level control suitable for detecting liquids, powders and granular solids. Automatic high/low level calibration with full manual override. LED display shows calibration and run mode readings. ATEX approved for explosive dust hazard area use.

Power shield compensator; prevents false signalling due to material build-up, sticking to probe. Reliable detection of most solids and liquids.

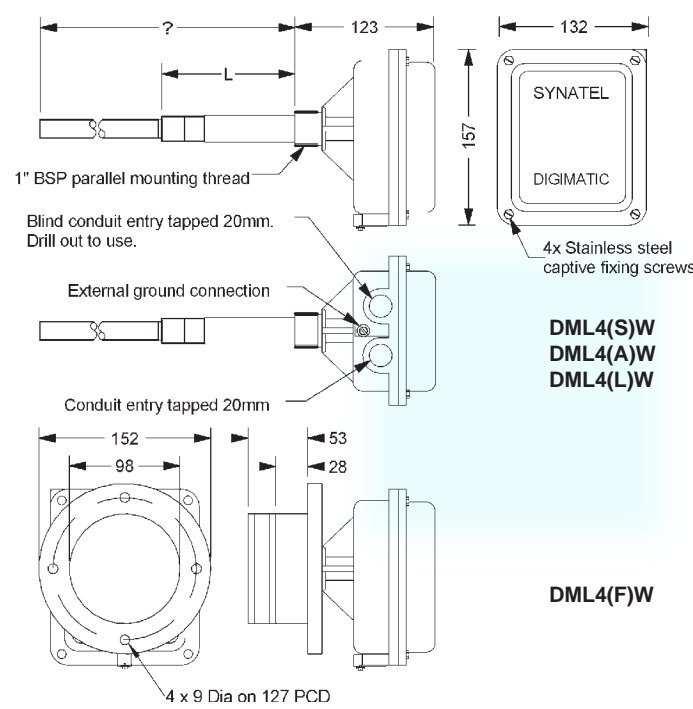
A range of unit types are available, including long & short powershield, flush probe mounting, \*clear viewing lid - displays are visible through windows to avoid cover removal.



DML4(A)W ATEX category: ⓂII 1D (Zone 20).

### Dimensions - Digimatic

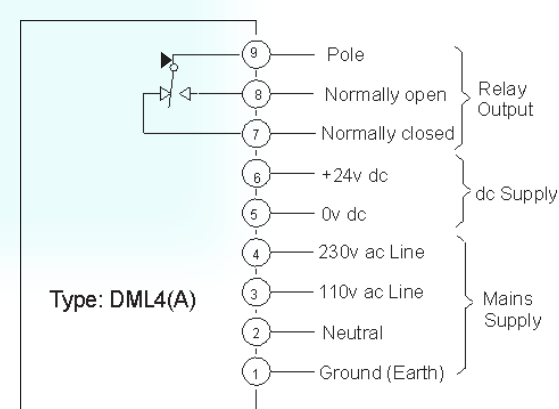
- L = 60mm for DML4(S)
- L = 121mm for DML4(A) standard
- L = Customer specified for DML4(L)



### SPECIFICATION - GENERAL

Supply	110/230V ac, 24V dc
Load	1.5A max ac, 50mA dc.
Ambient Temp	-10°C to +50°C.
Output	SPCO Relay rated @ 2.5A 240V ac Non Ind.
Output Mode	Switch selectable for output normally ON (high level) or normally OFF (low level).
Calibration	Membrane pushbutton with LED Display. Automatic calibration with full manual override.
Indicators	Digital display for calibration and run mode + power, timer and O/P LED's.
Mounting	1" BSP parallel.
Protection	IP65.
Compensator	Power shield compensates for material build up between probe and vessel wall. Prevents false signalling. Ideal for sticky or viscous materials.
Weight	<b>DML4(AW)</b> - 2Kg plus probe rod, 200mm rod: 0.25Kg. 300mm rod: 0.25Kg. 1 metre rod: 1.50Kg. 2 metre rod: 3.00Kg. 10 metre wire rope: 1.75Kg.

### Connections



The DIGIMATIC is supplied with a fuse fitted in the AC fuseholder, fit into the DC position for 24V dc operation. The fuse rating for this unit is 100mA anti-surge, IEC. **No other rating may be used.**

Stabilised 24V DC supply, +6.5% to -10%

### Probe head ordering codes:

Standard unit: **DML4(A)W**.  
Unit with short powershield: **DML4(S)W**.  
Unit with extended powershield to customer specified length: **DML4(L)W**. plus powershield length. i.e: DML4(L) 400 for unit with 400mm powershield.  
(Probe rods for above units - see 'probe rods section').  
Flush mounting unit: **DML4(F)W**  
**Option:**  
Remove **W**, unit will be fitted with a solid lid. i.e: **DML4(A)**.

\*Special Conditions of Use (Certificate includes X).  
Digimatics with a clear viewing lid - DML4(A)W - Where units are exposed to direct sunlight a cover **MUST** be fitted to shield from UV exposure. Applies to any version of Digimatic when fitted with clear lid

All dimensions shown in mm unless otherwise specified.

## DIGIMATIC REMOTE CAPACITANCE DMR2A

A 3 part, remote level sensor consisting of: a) Control unit **DRC205A**, b) Transverter **DCT2AA** signal conditioning interface, c) probe head/probe (type depends upon application/temperature).

Automatic high/low level calibration with full manual override. LED display shows calibration and run mode readings. Control module can be mounted up to 100 metres from probe head (ideal for installing into control panel). Probes available for up to 250°C use.

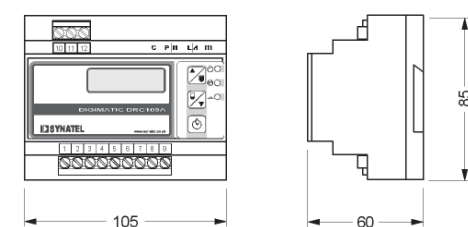
The DMR2A is ideal for all level sensing applications where temperature or vibration are a problem, or space is restricted. The control unit (DRC205A) may be up to 100 metres from the probe head allowing calibration without need to climb the silo.

All standard Digimatic features are retained including power shield compensator for preventing false signalling due to material build up.

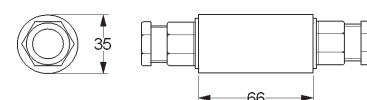


### Dimensions

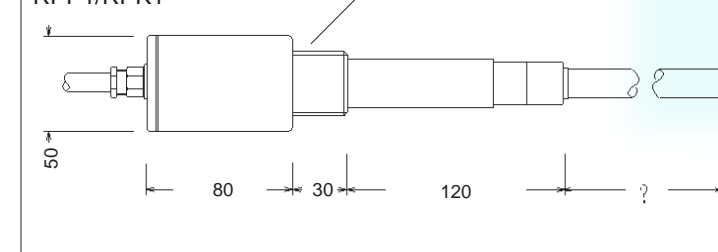
#### DRC205A



#### DCT2AA



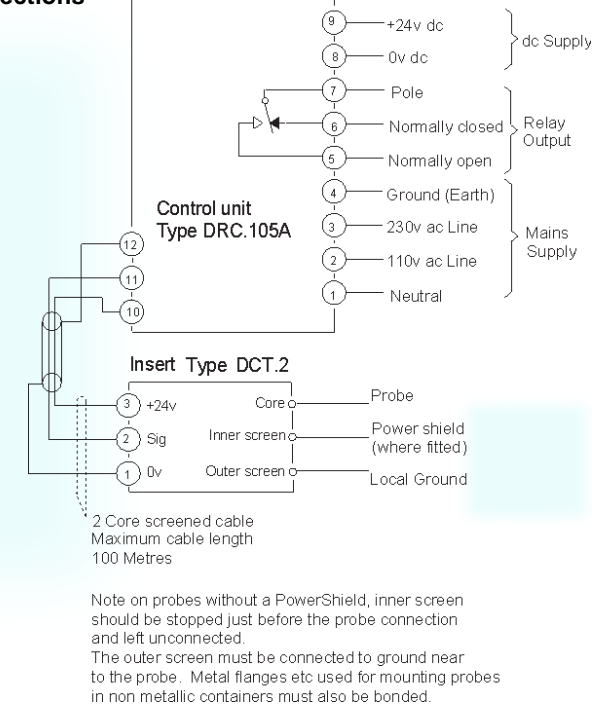
#### RPP1/RPK1



### SPECIFICATION - GENERAL

Supply	<b>DRC205A:</b> 110/230V ac, 24V dc
Load	1.5A max ac, 50mA dc.
Ambient Temp	-10°C to +50°C. for DRC105A, probe head depends upon type used (upto 250°C).
Probe Heads	<b>RPP1:</b> Polypropylene suitable upto 125°C. <b>RPK1:</b> PEEK suitable upto 250°C.
Output	SPCO Relay rated @ 2.5A 240V ac Non Ind.
Output Mode	Switch selectable for output normally ON (high level) or normally OFF (low level).
Calibration	Membrane pushbutton with LED Display.
Indicators	Digital display for calibration and run mode + power, timer and O/P LED's.
Mounting	1" BSP.
Protection	IP40 for <b>DRC205A</b> , IP65 all other parts.
Compensator	Power shield compensates for material build up between probe and vessel wall. Prevents false signalling.
Weight	<b>DRC205A</b> - 275gms. <b>DCT2AA</b> - 120gms. <b>RPP1/RPK1</b> - 410gms. Plus probe rods as detailed below.

### Connections



### Probe head ordering codes:

Standard unit: **RPP1** (250°C), PEEK unit: **RPK1** (350°C), plus control unit **DRC205A**, plus transverter unit **DCT2AA**, plus probe rod as required - see 'probe rods section'.

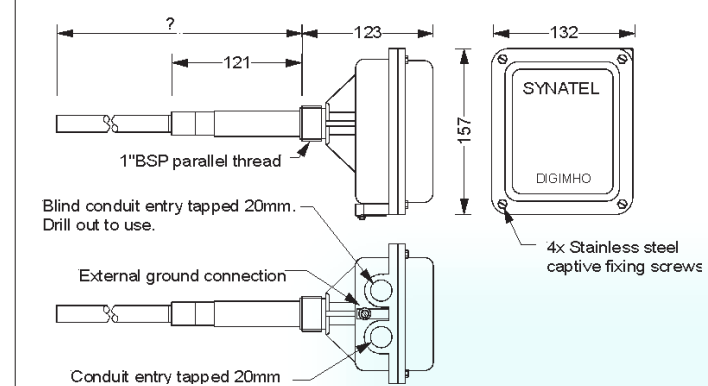
## DIGIMHO SELF CONTAINED RESISTANCE DRL1

Especially suited for use with highly conductive, sticky materials such as carbon black, treacle, molasses etc.

Measuring range covers 500 ohms to 20K ohms. Power shield to automatically compensate for build up of conductive material around probe, preventing false operation.



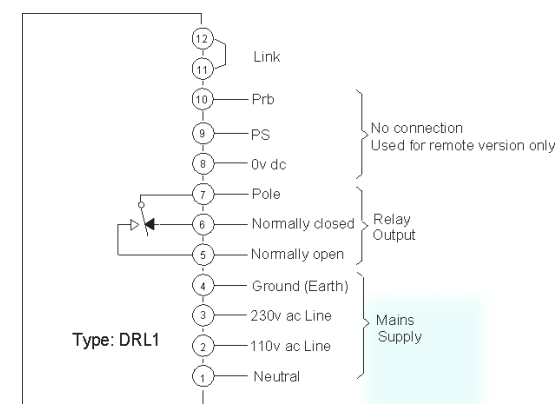
### Dimensions - Digimho



### SPECIFICATION - GENERAL

Supply	110/230V ac.
Load	1.5A max ac.
Ambient Temp	-10°C to +50°C.
Output	SPCO Relay rated @ 2.5A 240V ac Non Inductive.
Output Mode	Switch selectable for output normally ON (high level) or normally OFF (low level).
Calibration	6 x in-line DIP switches.
Indicators	Power, timer and O/P LED's.
Mounting	1" BSP.
Protection	IP65.
Compensator	Power shield compensates for material build up between probe and vessel wall. Prevents false signalling.
Weight	<b>DRL1</b> - 2Kg. 200mm rod: 0.25Kg. 300mm rod: 0.25Kg. 1 metre rod: 1.50Kg. 2 metre rod: 3.00Kg. 10 metre wire rope: 1.75Kg.

### Connections



### Probe head ordering code:

Standard unit: **DRL1**, plus probe rod as required - see 'probe rods section'.

### PROBE RODS

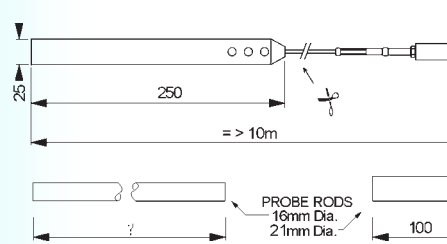
Solid probe rods are manufactured from 303 S31 stainless steel, 10metre wire rope is 316 stainless, weight & other fittings are 303 stainless steel.

### Probe rods for use with Digimatic DML4(A) & DMR2 plus Digimho DRL1:

Code	Description
822-006	100mm x 21mm dia. stainless steel. (200mm o/all)
822-005	200mm x 16mm dia. stainless steel. (300mm o/all)
822-003	1 metre x 16mm dia. stainless steel.
822-004	2 metre x 16mm dia. stainless steel.
823-004	10 metre stainless steel wire rope and weight.



### Dimensions - Probe Rods



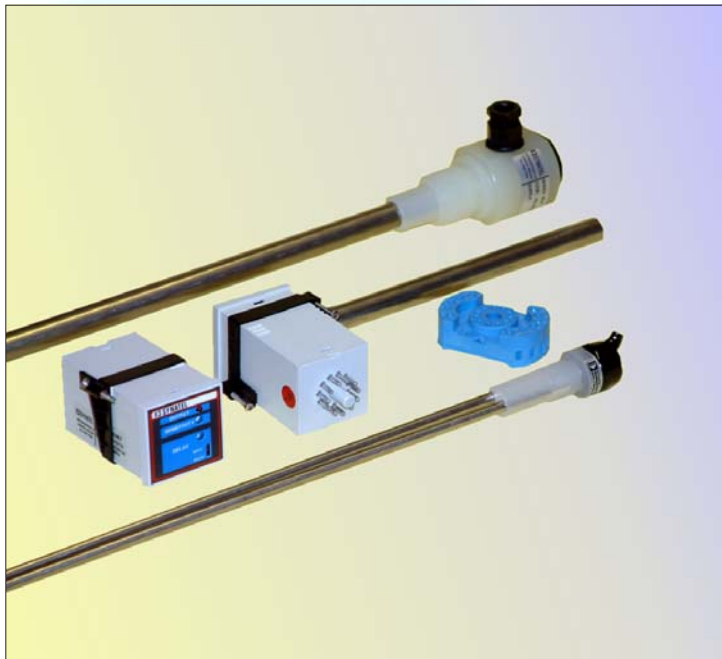


## MODULAR RESISTIVE LEVEL SYSTEM RLL48

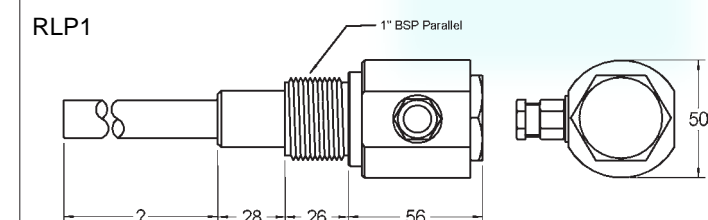
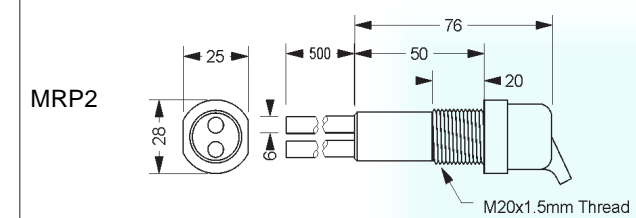
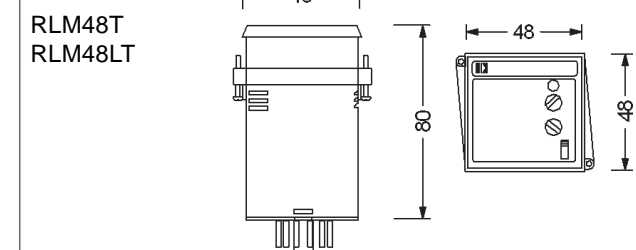
Consists of control module and separate probe units. Two probes can be used with one module to provide sequenced filling/emptying. Choice of 'high' level control (RLM48T) or 'low' level control (RLM48LT).

Adjustable time delay prevents spurious operation from liquid splashing.

Version also available for use with carbon black (RLM4 - refer to sales desk for more details).



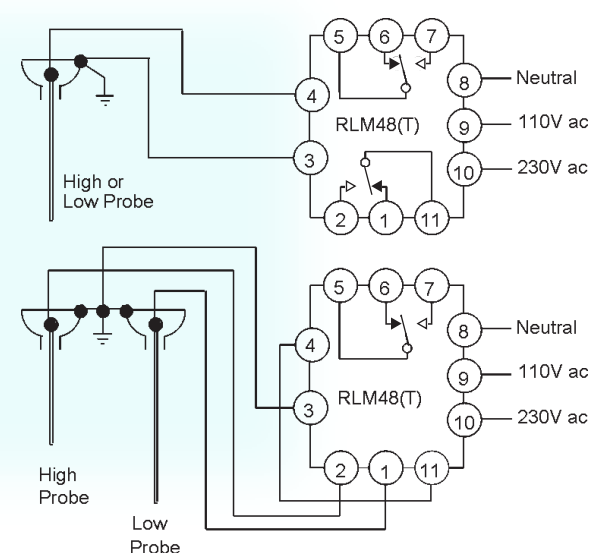
### Dimensions



### SPECIFICATION - GENERAL

Supply	110/230V ac.,
Load	1.5A max ac.
Ambient Temp	-15°C to +45°C for control module.
Output	SPCO Relay rated @ 2.5A 240V ac Non Ind.
Output Mode	RLM48T normally ON. RLM48LT normally OFF.
Calibration	Analogue rotary over range of 500 ohms to 30K ohms.
Indicators	Output LED.
Mounting	11 pin relay base roe RLM modules.
Protection	IP40 for RLM modules, probes typically IP65.
Weight	<b>RLM48T/RLM48LT</b> - 220gms. <b>RLP1</b> - 600gms + probe rod. <b>MRP2</b> - 300gms.

### Connections



To order specify probes from the following list plus appropriate control module.

Code	Description
823-008	MRP2, 20mm mounting. 2 x 500mm probes.
823-009	RLP1, 1" bsp mounting. Choice of probe lengths. See 'probe rods section' for details.

### Module ordering codes:

High level control module: **RLM48T**.

Low level control module: **RLM48LT**.

11 pin international plug-in relay base required for modules.

### photoelectric sensors



### proximity sensors



### speed monitors



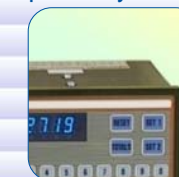
### counters & tachometers



### level control sensors



### special systems



**SYNATEL**  
INSTRUMENTATION LTD.



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in Action

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e-mail: [sales@synatel.co.uk](mailto:sales@synatel.co.uk)





PHOTOELECTRIC SENSORS



PROXIMITY SENSORS



SPEED MONITORS



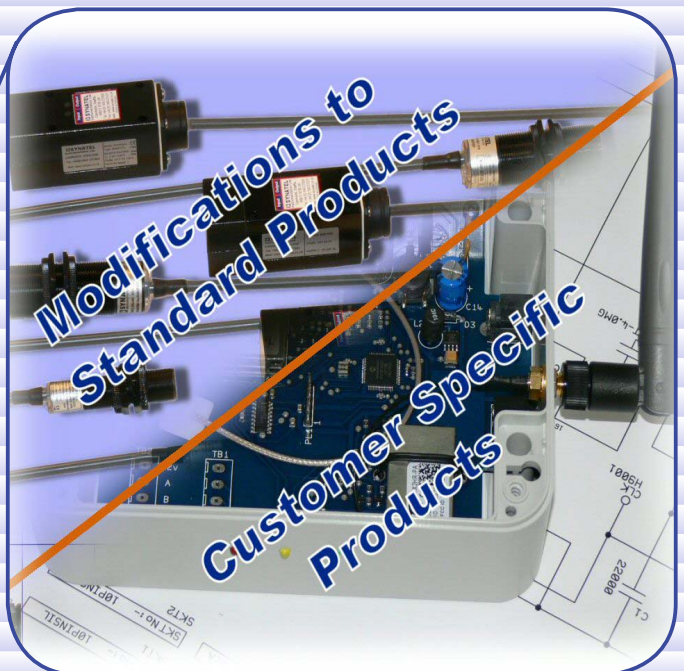
COUNTERS AND TACHOMETERS



LEVEL CONTROL SENSORS



SPECIAL SYSTEMS



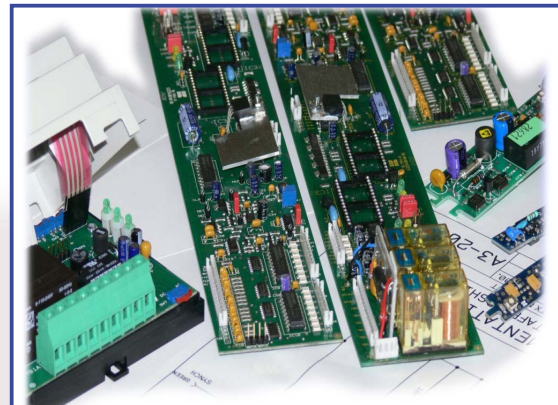


## SPECIAL/CUSTOM SYSTEMS CATALOGUE

Synatel have their own in-house design & manufacturing capabilities including: Expert CAD/CAM design & draughting staff, component sourcing & purchasing expertise, manual & automatic PCB assembly & flow soldering. Plus we have a dedicated team of test engineers using manual, semi-automatic & automatic test rigs to ensure high quality, reliable products every-time. **SYNATEL - Detection & Control in Action!**

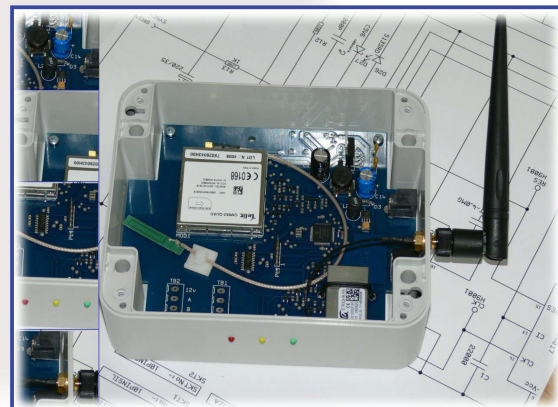
### CUSTOM DESIGN/MANUFACTURE

- ▶ From concept through to finished product.
- ▶ Existing circuit boards manufactured, populated & tested.
- ▶ Product modification/design.
- ▶ Redesign/manufacture of existing circuit.
- ▶ International approvals applied, where required.



### WIRELESS COMMUNICATION

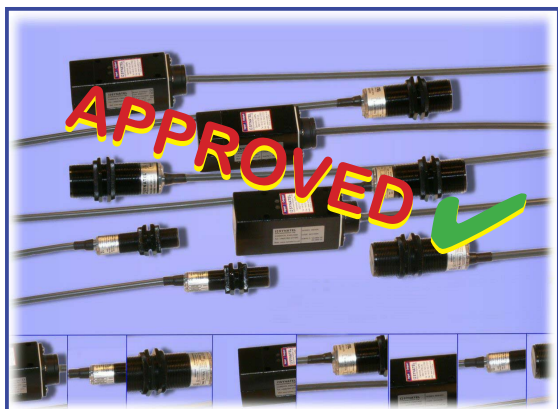
- ▶ Full Wireless Communication.
- ▶ Bluetooth Communication.
- ▶ Network Capability. WLAN.
- ▶ Telecoms. Text or e-mail notifications.



### APPROVALS

- ▶ ATEX - UK/European markets.
- ▶ IECEx - International markets inc. Australia & Singapore.
- ▶ CSA - Canadian/North American markets.
- ▶ InMetro - Brazilian market.
- ▶ CE - Low voltage, RF directives etc. (contact us for details).

*(Some approvals are available as standard, others available at certification cost).*



If you have specialist sensor needs, contact Synatel - our expert Sales & Design staff are happy to talk through your requirements & provide quotations against your specifications. Quantities, Approvals (if required) & time scales are all taken into consideration - giving you all the information that you require to enable you to make an informed decision.

**Call +44 (0) 1543 277003, or e-mail [sales@synatel.co.uk](mailto:sales@synatel.co.uk) for more information.**

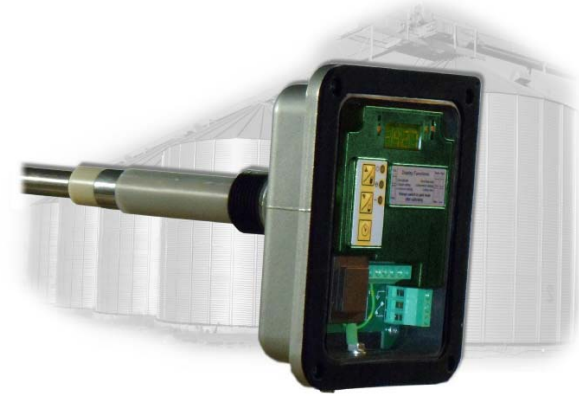
**See our website: [www.synatel.co.uk](http://www.synatel.co.uk)**

xxxxxx? Special\_Systems2015

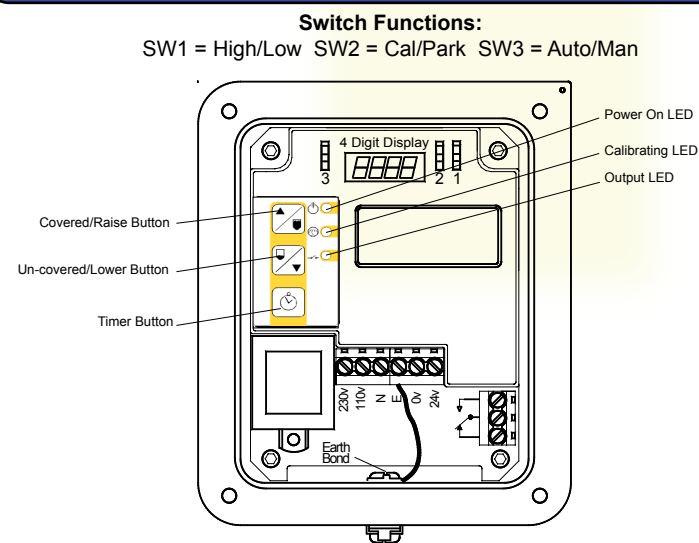
## DIGIMATIC DML4AI ATEX & IECEx APPROVED CAPACITANCE LEVEL PROBE SENSOR

A fixed point RF, capacitance level control suitable for use in non-conductive liquid & free flowing granular solids. Approved for use in explosive dust hazard areas, such as flour mills, silo's, saw mills, paper mills. Multivoltage supplies, relay output, powershield technology - compensates for material build up/sticking to probe rod (prevents false signalling).

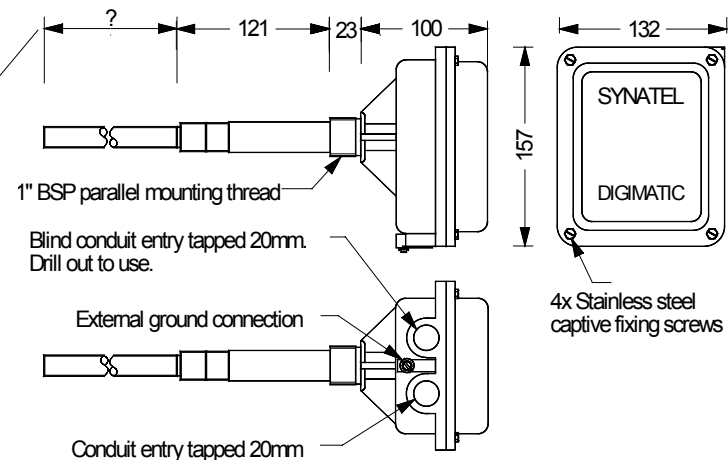
- ▶ ATEX/IECEx approved (explosive dust hazard area) - conforms to EN60079 directive(s).
- ▶ Programmable sensitivity for product being detected.
- ▶ Programmable output timer - prevents false signalling from material 'splashing' on probe rod.
- ▶ Powershield - prevents false signalling from material sticking/clinging to probe rod & side wall of container.
- ▶ LED display - used for calibrating sensitivity & timer settings, also shows material actual level sensing values in run mode.
- ▶ Multi Voltage Supplies: 24V dc or 110/240V ac.
- ▶ Relay output. Volt free change over contacts.
- ▶ 1" BSP male mounting thread.
- ▶ LED indication of Power On, Calibrating & Output state.
- ▶ Membrane keypad for programming sensitivity & timer settings.



### CONNECTIONS/FUNCTIONS



### DIMENSIONS - standard unit



? = Probe Rod Lengths: 100mm x 24mm dia.  
30 cm x 16mm dia.  
1 metre x 16mm dia.  
2 metre x 16mm dia.  
10 metre wire rope & weight.

Note: 1 metre, 2 metre & 10 metre wire rope probes can be cut to length, on site using a hacksaw.

#### ATEX Certificate Details - DML4AI:

Certificate No: TRAC11ATEX11268X  
ExII 1 (1)D

#### IECEx Certificate Details - DML4AI:

Certificate No: TRC 12.0016X  
Ex ta[ia] IIIC T100°C  
-20°C ≤ Tamb ≤ +50°C IP65

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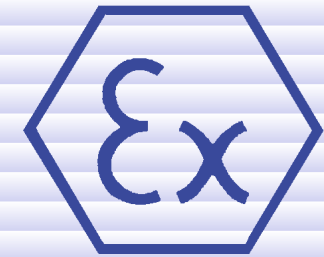
Web: [www.synatel.co.uk](http://www.synatel.co.uk)  
e-mail: [sales@synatel.co.uk](mailto:sales@synatel.co.uk)



xxxxxx? ATEX\_IECEx2015

Conform to relevant parts of BS EN 60079 Standards

## ATEX & IECEx APPROVED SENSORS CATALOGUE 7



ALSO AVAILABLE FROM SYNATEL:

PHOTOELECTRIC SENSORS



PROXIMITY SENSORS



SPEED MONITORS



COUNTERS AND TACHOMETERS



LEVEL CONTROL SENSORS



SPECIAL SYSTEMS





## 18mm & 30mm ATEX & IECEx SENSORS

A range of sensors including: Inductive & Capacitive proximity switches, stopped motion and underspeed monitors all ATEX & IECEx approved to EN60079 directive. Certified for Dust or Gas hazard area use as shown. Units are fully encapsulated to help minimize effects from vibration & prevent moisture ingress.

- ▶ All units on this page are ATEX/IECEx approved (explosive dust/gas hazard area) - conforms to EN60079 directive(s).

### Inductive proximity sensor 18mm Diameter housing (1)

ID/E1MOAI  
ID1MZAI  
IE1MZAI

- ▶ 10-30V dc 4 wire npn/pnp connection (3) & (4), or 24-240V ac/dc 2 wire FET output connection (5)
- ▶ 8mm operating range, 100mA output, 100 Hz operating speed.



### Inductive stopped motion sensor 18mm Diameter housing (1)

SU1MZAI

- ▶ 24-240V ac/dc 2 wire FET output connection (5)
- ▶ 8mm operating range, 100mA output, 15-3600 ppm operating speed. (4 seconds between pulses min.)



### Inductive Proximity sensor 30mm Diameter Housing (2)

ID/E1TOAI  
ID1TZAI  
IE1TZAI

- ▶ 10-30V dc 4 wire npn/pnp connection (3) & (4), or 24-240V ac/dc 2 wire FET output connection (5)
- ▶ 9mm operating range, 100mA output, 100 Hz operating speed.



### Inductive Underspeed Sensor 30mm Diameter Housing (2)

PU1TZAI  
PU1TRAJ

- ▶ 24-240V ac/dc 2 wire FET output connection (5) or 15-240V dc/24-240V ac 5 wire relay output connection (7)
- ▶ 9mm operating range, 10-3600 ppm operating speed. (20% trip below normal running speed).  
2 wire - 100mA output.  
5 wire - 3A non-ind. output.



### Capacitive Proximity Sensor 30mm Diameter Housing (2)

CD1TZAI  
CE1TZAI  
CD1TRAJ  
CE1TRAJ

- ▶ 24-240V ac/dc 2 wire FET output connection (5) or 15-240V dc/24-240V ac 5 wire relay output connection (7)
- ▶ Typically 25mm operating range (adjustable).  
2 wire - 100mA output.  
5 wire - 3A non-ind. output.



#### ATEX Certificate Details - 18mm Sensors:

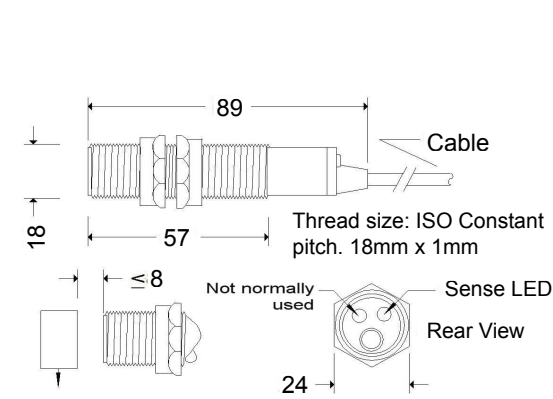
Certificate No: Baseefa14ATEX0115X  
ExII 2G  
ExII 2D  
ExI M2

#### IECEx Certificate Details - 18mm Sensors:

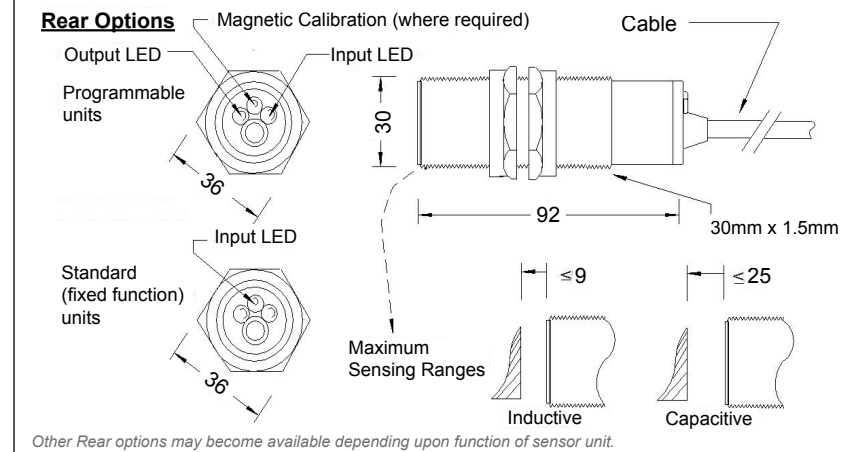
Certificate No: BAS 14.0061X  
Ex mb IIC T5 Gb  
Ex mb IIIC T1000°C Db  
Ex mb I Mb  
-15°C ≥ Tamb ≥ +50°C IP66

## DIMENSIONS

### 18mm Diameter Sensors (1)



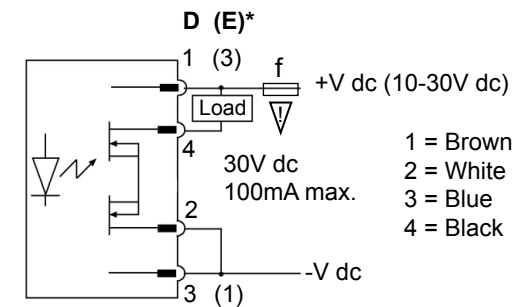
### 30mm Diameter Sensors (2)



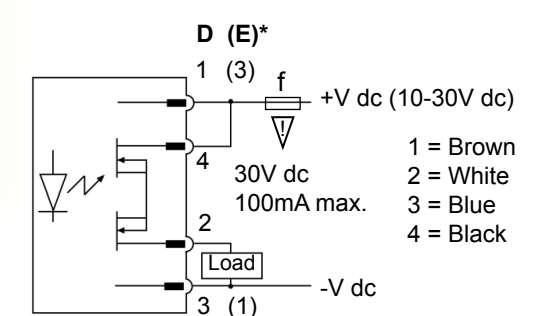
## CONNECTIONS (options)

### 4 wire dc connections (3)

#### Current Sink (nnp)

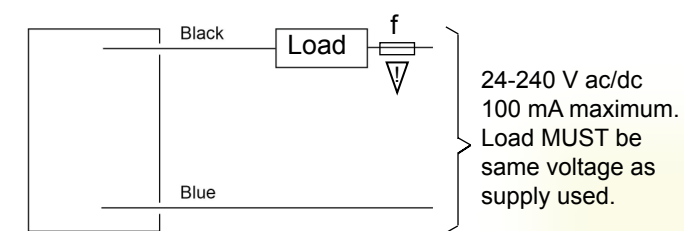


#### Current Source (pnp)



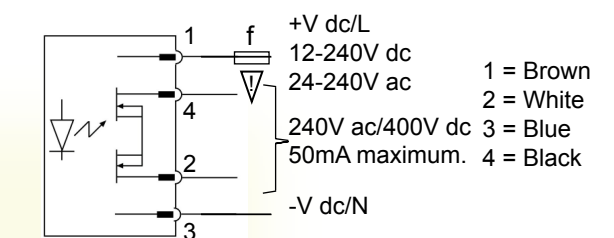
Note\*: Supply Connections: Output normally OFF - use D connections, Output normally ON - use (E) connections.

### 2 wire dc connections (5)



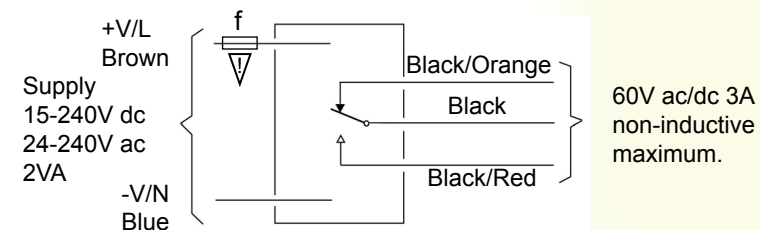
### 4 wire universal connections (6)

Note: Check supply voltage required is not only 10-30V dc before using these connections.



Note: additional output fusing may be required to suit application, local regulations, certification requirements.

### 5 wire relay connections (7)



Note: additional output fusing may be required to suit application, local regulations, certification requirements.

#### ATEX Certificate Details - 30mm Sensors:

Certificate No: Baseefa12ATEX0266X  
ExII 1G  
ExII 1D

## IMPORTANT NOTE!



Fusing: 1500A Capable (500mA maximum rating).  
1 fuse per unit **MUST** be used.

#### IECEx Certificate Details - 30mm Sensors:

Certificate No: BAS 12.0118X  
Ex ma IIC T5 Ga  
Ex ma IIIC T1000°C Da  
-15°C ≥ Tamb ≥ +50°C IP66