

## New products

**NEC / SCHOTT**  
SEFUSE thermal fuse



From **£0.26** See page 689

**ASSEMtech**  
EUROPE

Linear acceleration switch



From **£3.71** See page 690

**ASSEMtech**  
EUROPE

Proximity reed switches

Cylindrical switch



From **£2.81** See page 693

**ASSEMtech**  
EUROPE

Proximity reed switches

Threaded magnet



From **£11.96** See page 693

**ASSEMtech**  
EUROPE

Neodymium disc magnets



From **£0.1872**

See page 692

**ASSEMtech**  
EUROPE

Sensolute micro vibration sensor omnidirectional



From **£2.39** See page 694

## Best sellers

**AT SEMITEC LIMITED**  
IP67 10K Precision NTC thermistor probe with lead



From **£4.00** See page 686

**TruSens**  
KC7783R PIR Module



From **£5.08** See page 695

**RVFM**  
Ultrasonic range finder SRF05

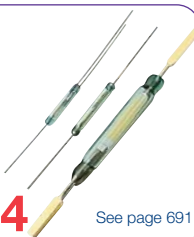


See page 698

From **£12.43**

**ASSEMtech**  
EUROPE

Reed switches



From **£0.2964** See page 691

**MICROTHERM**  
Solid state MOXIE thermal sensors



From **£2.42** See page 688

**TruSens**  
Brass proximity switch



From **£2.44** See page 694

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## Thermocouples



### Exposed junction thermocouples – types J, K and T

A range of exposed junction thermocouples.

- Available in types J, K or T
- Available in a variety of lengths
- Welded tip
- Low mass exposed junction gives fast response
- Recommended for applications where the greatest sensitivity and quickest response is required
- Ideal for test and development applications
- Rated temperatures from -75°C to +400°C



Technical specification							
Type	Insulation material	Wire dia.	Length	+ve wire material	-ve wire material	Temp. range °C min. max.	Order code
1360 K	Glass fibre	1/0.315mm	2m	NiCr	NIAl	-60 350	<b>61-1256</b>
1360 J	Glass fibre	1/0.315mm	2m	NiCr	NIAl	-60 350	<b>61-1258</b>
1360 K	PFA	1/0.2mm	1m	NiCr	NIAl	-75 250	<b>61-1252</b>
1360 T	PFA	1/0.2mm	1m	Cu	Constantan	-75 250	<b>61-1254</b>

Type	Order code	1+	5+	25+
Type K glass fibre 2m	<b>61-1256</b>	3.80	3.59	3.42
Type J glass fibre 2m	<b>61-1258</b>	3.34	3.07	2.89

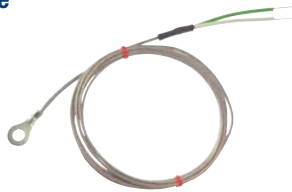
Pack of 5				
Type K PFA	<b>61-1252</b>	9.88	9.22	8.65
Type T PFA	<b>61-1254</b>	10.82	10.35	9.78



### Washer-ended thermocouple

A type J or type K thermocouple housed in a washer eyelet.

- Washer-ended for surface measurement
- Grounded tip for fast thermal response
- Washer with 6mm clearance hole
- 2m glassfibre stainless steel braided extension lead with twin 7/0.2mm wire
- Rated at 350°C
- **Labfacility FW-** series



Type	Order code	1+	5+	25+
J Type washer ended	<b>61-1260</b>	10.35	10.19	9.56
K Type washer ended	<b>61-1262</b>	11.39	10.97	10.29



### Type K mineral insulated thermocouple with tail

A range of Type K mineral insulated thermocouples with 100mm tails. Small overall dimension and high flexibility make these thermocouples ideal for situations involving poor accessibility.

- Excellent mechanical strength
- Mineral insulation provides protection against oxidation, corrosion and contamination
- Fast thermal response
- 310 stainless steel sheath
- M8 x 1.0 threaded pot (max. temp 200°C)
- Temperature range -100°C to +1100°C
- Tails 100mm, PFA insulated twin twisted, 7/0.2mm
- **Labfacility MD-ISK-** series



Type	Order code	1+	5+	25+
K Thermocouple 1.5 x 150	<b>61-1240</b>	10.98	10.25	9.88
K Thermocouple 3 x 150	<b>61-1242</b>	11.96	11.39	11.02



### Heavy duty rigid probe thermocouple

A heavy duty, rigid thermocouple probe available in either Type K or Type J.

- Rugged design
- Grounded junction for fast response
- Probe is 150mm long and 4.5mm diameter
- 2m glassfibre insulated, stainless steel braided lead with 7/0.2 wire
- Temperature range -60°C to +350°C
- **Labfacility FAA-GSx** series



Type	Order code	1+	5+	25+
K heavy duty thermocouple	<b>61-1264</b>	11.65	10.88	10.19
J heavy duty thermocouple	<b>61-1266</b>	10.82	10.10	9.46



### Type K industrial mineral insulated thermocouple with terminal head

A range of Type K mineral insulated thermocouples which are housed in a lightweight and robust aluminium terminal head.

- Mineral insulation provides protection against oxidation, corrosion and contamination
- Fast thermal response
- 6mm diameter 310 stainless steel sheath
- Aluminium terminal head with M20 x 1.5mm cable entry
- Temperature range -100°C to +1100°C
- Probe length: 100mm
- Terminal head rated to IP67
- **Labfacility MC-ISK** series



Type	Order code	1+
K thermocouple 100mm	<b>61-1246</b>	16.30



### Standard thermocouple connectors

A range of standard thermocouple connectors available in Type K.

- Connectors polarised to ensure correct connection
- +220°C continuous rating
- **Labfacility IS** series



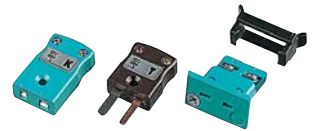
Type	Order code	1+	5+	25+
Type K line socket	<b>61-1288</b>	2.37	2.20	2.07



### Miniature thermocouple connectors

A range of miniature thermocouple connectors with flat pins and terminal/contact materials to suit the thermocouple type, thus avoiding the introduction of errors.

- Available in line plug and socket plus fascia socket for various type thermocouples
- Plug and socket polarised to ensure correct connection
- Fascia socket has quick and simple clip mounting
- Moulded plastic bodies colour coded to IEC584-3, BS4937
- **Labfacility IM** series



Technical specification				
Labfacility code	Connector type	Thermocouple type	Continuous operating temperature max.	Order code
<b>IM-K-M</b>	Line plug	K	220°C	<b>61-1140</b>
<b>IM-K-LCF</b>	Line socket	K	220°C	<b>61-1272</b>
<b>IM-K-FF</b>	Fascia socket	K	120°C	<b>61-1150</b>
<b>IM-T-M</b>	Line plug	T	220°C	<b>61-1270</b>
<b>IM-T-LCF</b>	Line socket	T	220°C	<b>61-1274</b>

Type	Order code	1+	5+	25+
<b>Type K</b>				
Line plug	<b>61-1140</b>	1.77	1.70	1.61
Line socket	<b>61-1272</b>	1.77	1.66	1.56
Fascia socket	<b>61-1150</b>	2.24	2.13	2.03
<b>Type T</b>				
Line plug	<b>61-1270</b>	1.77	1.66	1.56
Line socket	<b>61-1274</b>	1.77	1.66	1.56



### Thermocouple wire PVC insulated

Thermocouple wire with PVC insulation which is available in Type K.

- PVC insulated flat pair
- Stranded conductors 7/0.2
- Overall PVC sheath
- Insulation rating -10°C to +105°C
- Tolerance Class 2
- Colour coded to IEC 584-3
- Supplied on reels of 50m



50m reel				
Type	Order code	1+	5+	25+
Type K wire	<b>61-1291</b>	31.15	29.59	28.55

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Thermocouple wire PVC insulated mylar screened**

Thermocouple wire with PVC insulation and mylar screening which is available in Type K.

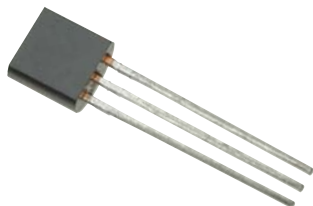
- PVC insulated
- Stranded conductors 7/0.2
- Overall PVC sheath
- Screened with mylar tape and bare copper drain wire
- Insulation rating -10°C to +105°C
- Tolerance Class 2
- Colour coded to **IEC 584-3**
- Supplied on **reels of 50m**



50m reel				
Type	Order code	1+	5+	25+
Type K wire	<b>61-1294</b>	40.04	37.38	35.04

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**Temperature sensor ICs**

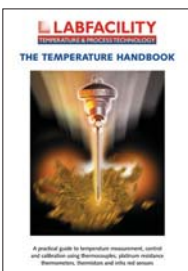


**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**The Temperature Handbook**

Labfacility, 2004, 139 pages. A comprehensive reference text and user guide to assist those involved in temperature measurement and control. This book will provide guidance on temperature measurement, control and calibration using thermocouples, platinum resistance thermometers, thermistors and infrared sensors.

- Budget priced, comprehensive and up to date reference text
- Detailed enough for engineers and scientists but also suitable for technicians and students
- Written with a practical bias
- Contains considerable reference data and basic theory
- Ideal as a training aid
- 2004 edition
- A5 size
- Contains 139 pages, 40 of which are reference data



Technical specification  
Chapter contents:

- |   |                                    |
|---|------------------------------------|
| 1. Introduction   | 8. Temperature control             |
| 2. Temperature measurement using electrical techniques      | 9. Reference section               |
| 3. Thermocouple theory and practise                         | 10. Glossary of terms              |
| 4. Resistance thermometer theory and practise               | 11. Acknowledgments and references |
| 5. NTC thermistor and infrared (non-contact) sensors        | 12. Frequently asked questions     |
| 6. Sheath materials, thermowells, fittings and terminations | 13. Index                          |
| 7. Temperature calibration                                  |                                    |
| 8. Transmitters and instrumentation                         |                                    |

Type	Order code	1+	5+	25+
Temperature handbook	<b>61-1298</b>	7.44	6.94	6.50

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**STM8 Discovery evaluation kit**

Based around an STM8S105 microcontroller this kit includes an embedded debugger, ST-LINK and a touch sensing button

**ONLY**  
**£6.49**  
**82-5056**



**PRTs**

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Pt100 General purpose Platinum Resistance Thermometers**

A heavy duty, industrial Pt100 Platinum Resistance Thermometer (PRT) which is an ideal general purpose component in a temperature measuring system.

- Pt100 Class B, 4 wire
- Stainless steel rigid sheath
- 6mm diameter, 50mm long
- 2 metre, 4 core 7/0.2mm silicone rubber insulated lead
- Operating temperature -50°C to +200°C
- **Labfacility type DRG 010632A**



Type	Order code	1+	5+	25+
Pt100 GP PRT	<b>61-1212</b>	32.24	30.09	28.22

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Precision Pt100 PRT**

A high accuracy Pt100 Platinum Resistance Thermometer (PRT) with bare wire terminations.

- Ideal for use as a precision reference probe
- Pt100, 4 wire
- 316 stainless steel welded tip probe
- Extension lead PTFE insulated, 7/0.2mm, 2m long with 100mm tails
- Tip temperature rating -50°C to +250°C
- Accuracy ±0.06°C @ 0°C
- Probe dimensions 6mm dia. x 250mm long
- Close tolerance to **IEC60751**
- **Labfacility type L250**



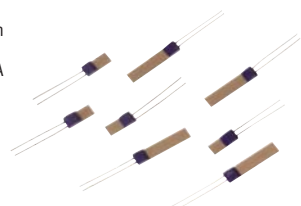
Type	Order code	1+	5+	25+
Precision Pt100 PRT	<b>61-1210</b>	62.40	58.24	54.60

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Pt100/Pt1000 Class A and B thin film Platinum Resistance Thermometers**

This series of Platinum Resistance Thermometers (PRT), constructed using thin film elements, are available with various sensor dimensions in either IEC751 Class A or Class B tolerances.

- -50°C to +550°C temperature measurement range
- 10mm tails
- Ideal solution for surface mounting measurement applications
- Fast response times
- Good vibration resistance
- Long-term stability
- Conforms to **IEC751 Class A or Class B**
- **Labfacility DM-** series



Technical specification

Labfacility code	Sensor type	IEC751 Class	Sensor dims (mm)	Order code
<b>DM-508</b>	Pt100	A	2 x 5	<b>61-1222</b>
<b>DM-503</b>	Pt100	B	2 x 5	<b>61-1205</b>
<b>DM-334</b>	Pt100	A	2 x 10	<b>61-1224</b>
<b>DM-333</b>	Pt100	B	2 x 10	<b>61-1226</b>
<b>DM-303</b>	Pt100	A	2 x 2.3	<b>61-1228</b>
<b>DM-301</b>	Pt100	B	2 x 2.3	<b>61-1230</b>
<b>DM-310</b>	Pt1000	A	2 x 10	<b>61-1232</b>
<b>DM-507</b>	Pt1000	B	2 x 10	<b>61-1234</b>

	Pt100 sensor -50°C to +550°C	Pt1000 sensor -50°C to +550°C
Temperature range	-50°C to +550°C	-50°C to +550°C
Ice point resistance	100Ω	1000Ω
Fundamental interval (0°C to 100°C)	38.5Ω nom.	385Ω nom.
Self heating	0.005°C/mW	0.5°C/mW
Thermal response	0.1s	0.1s
Stability	±0.05%	±0.05%

Type	Order code	1+	5+	25+
DM-508	<b>61-1222</b>	2.80	2.59	2.46
DM-503	<b>61-1205</b>	2.34	2.13	2.07
DM-334	<b>61-1224</b>	3.46	3.19	2.96
DM-333	<b>61-1226</b>	2.74	2.53	2.34
DM-303	<b>61-1228</b>	3.59	3.31	3.07
DM-301	<b>61-1230</b>	2.86	2.64	2.44
DM-310	<b>61-1232</b>	5.35	4.93	4.58
DM-507	<b>61-1234</b>	3.89	3.59	3.33

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Pt100 PRT 6mm Probe with extension lead**

Pt100 Platinum Resistance Thermometer (PRT) fitted with an extension lead and available with a 6mm diameter probe.



- Accurate, general purpose temperature sensor
- Pt100, Class B, 4-wire connection
- Stainless steel probe
- 6mm diameter probe
- Fitted with a 2 metre PFA screened 4-core 7/0.2mm extension lead
- Plain pot seal
- Temperature range -50°C to +200°C

Technical specification				
Probe diameter	Mftrs. part number	Order code		
6mm	RAA-S48-60-150-NP-2.0-C2PFA-T	61-1208		
Type	Order code	1+	5+	25+
Pt100 probe 6mm dia.	61-1208	33.80	31.56	29.58

**LABFACILITY**  
TEMPERATURE & PROCESS TECHNOLOGY

**Pt100 PRT Probe with terminal head**



A range of Pt100 Platinum Resistance Thermometers (PRT), available in a variety of probe lengths and featuring an all-weather terminal head which facilitates installation and interconnection with instrumentation.

- Platinum element Pt100 (class B) 4 wire
- Probe lengths available 100, 200 and 400mm
- Stainless steel (316) 6mm diameter sheath
- Terminal block termination
- M20 cable gland
- Continuous temperature range -150°C to +450°C
- Terminal head provides protection to IP67

Technical specification				
Probe length	Mftrs. part number	Order code		
100mm	RCA-S60-100-KNE	61-1216		
400mm	RCA-S60-400-KNE	61-1220		
Type	Order code	1+	5+	25+
Pt100 PRT 100mm	61-1216	43.68	40.77	38.22
Pt100 PRT 400mm	61-1220	50.44	47.08	44.14

**AT SEMITEC LIMITED**

**IP67 10K Precision NTC thermistor probe with lead**



A high precision thermal sensing device that features an extremely small B-value tolerance and resistance. When the device is used as a temperature gauge there is no requirement for adjustment between control circuit, ensuring good temperature precision.

- Small B-value tolerance
- High temperature precision ±0.3°C
- **ATC Semitec type 103AT-11**

Technical specification					
Rated zero power resistance (kΩ)	B-value	Dissipation factor (mW/°C)	Thermal time constant (s)	Rated power @25°C (mW)	Operating temp. range (°C)
10 ±1%	3435K ±1%	3	75	15	-50 to +105
Type	Order code	1+	5+	10+	
Thermistor probe 10K	61-2040	5.15	4.68	4.00	

**AT SEMITEC LIMITED**

**Pipe-clip temperature sensors**

A range of pipe-clip temperature sensors that have been designed for the measurement and control of hot and cold water systems. Its integral spring steel clip can be used to mount the sensor onto metal pipes, ensuring the sensing portion is held tight against the pipe wall enabling quick and accurate temperature measurement of the liquid inside the pipe thus eliminating the need for any invasive holes. Applications include air-conditioning systems, domestic gas boilers, water saving devices for hotels, pubs, etc.



For quick, simple and accurate temperature measurement

- Fast response sensor within a PBT housing
- Integral spring steel clip
- Push on terminals
- Simple to install
- High moisture resistance
- For pipes with diameter from 12 to 22mm
- **ATC Semitec CH series**

- For quick, simple and accurate temperature measurement
- Fast response sensor within a PBT housing
- Integral spring steel clip
- Push on terminals
- Simple to install
- High moisture resistance
- For pipes with diameter from 12 to 22mm
- **ATC Semitec CH series**

Technical specification				
Time constant	<1s	R25 value	10kΩ	B25/85 value
R85 accuracy	±1K (°C)	Operating temperature range	-20°C to +120°C	Dielectric strength
			500V AC for 1 minute	
Pipe dia.	Order code	1+	100+	
20-22mm	26-7470	1.87	1.66	
16-18mm	26-7472	1.66	1.46	
12-14mm	26-7474	1.66	1.46	

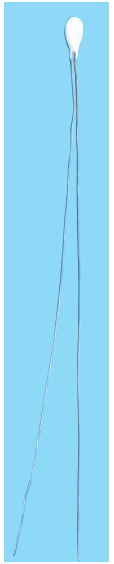
**Thermistors**

**AT SEMITEC LIMITED**

**Interchangeable NTC thermistors**

A range of fast response design thermistors that feature interchangeability between NTCs. The devices have excellent long-term stability and a wide operating temperature range. Typical applications include: heating and air conditioning systems, industrial electronics/instrumentation, automotive electronics.

- Fast response
- Excellent long term stability
- Epoxy resin encapsulated
- Wide operating temperature range
- Lead wires ø0.25mm
- Dimensions 3 x 2.4 x 50mm long
- **ATC Semitec SP series**



Technical specification				
Order code	Rated zero power resistance (kΩ)	B-value		
61-2042	2.252	3977		
61-2044	3	3977		
61-2046	5	3977		
61-2048	10	3977		
61-2070	50	4262		
61-2072	100	4262		
Dissipation factor (mW/K)				
2				
Thermal time constant (s)				
15				
Rated power @25°C (mW)				
60				
Operating temp. range (°C)				
-50 to +150				
Temperature tolerance (K)				
±0.2				
Rated temperature (°C)				
25				
Heat capacity (mJ/K)				
15				
Po Resistance	Order code	1+	25+	100+
2K252	61-2042	0.738		
3K	61-2044	2.07	1.77	1.56
5K	61-2046	0.738		
10K	61-2048	2.07	1.77	1.56
50K	61-2070	0.738		
100K	61-2072	0.738		



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## Tactile switches 6 x 6mm

A range of miniature through hole tactile switches

FROM £0.03



### NTC Surface mount 0805 thermistors

These NTC surface mount thermistors from Murata have nickel barrier termination and provide excellent solderability and high stability.

- The unique internal construction produces superior long time aging stability plus high accuracy resistance and B-constant
- Supplied on reels of 4000



Resistance	B-constant K*	Max operating current mA	Power rating mW	Diss constant range mW/°C	Temp range	Order code
10k	3900	0.44	200	2	-40°C to +125°C	61-0460
100k	4250	0.14	200	2	-40°C to +125°C	61-0462

\* tolerance ±5%

Murata code	Resistance	Type	Order code	1+	25+	100+	500+
NCP21XV103J03RA	10k	NTC 100k Thermistor SM	61-0462	0.10	0.0936	0.078	0.0676
NCP21WF104J03RA	100k						



### NTC disc thermistors

A range of miniature disc thermistors for general purpose applications such as temperature measurement and thermal compensation circuitry.

- The thermistors are clearly coded and have a wide working temperature range of -30°C to +125°C and a tolerance of 10%



Resistance at 25°C	Approx. resistance @ 100°C	Max. current @ 25°C	B-Constant	Thermal time constant	Order code
100Ω	11Ω	3200mA	3200K	20s	61-0398
300Ω	24Ω	115mA	3500K	22s	61-0400
1kΩ	90Ω	70mA	3800K	22s	61-0405
5kΩ	300Ω	30mA	3950K	21s	61-0410
20kΩ	1kΩ	20mA	4250K	23s	61-0415
100kΩ	5kΩ	10mA	4400K	24s	61-0420

Type	Order code	1+	25+	100+	500+
100Ω	61-0398	0.29	0.212	0.159	0.1442
300Ω	61-0400	0.22	0.1696	0.1272	0.1166
1kΩ	61-0405	0.22	0.1696	0.1272	0.1166
5kΩ	61-0410	0.22	0.1696	0.1272	0.1166
20kΩ	61-0415	0.22	0.1696	0.1272	0.1166
100kΩ	61-0420	0.22	0.1696	0.1272	0.1166



### Precision NTC thermistors

A range of high precision thermal sensing devices.

- Features an extremely small B-value tolerance and resistance
- When used in temperature measurements the thermistor requires no adjustment between control circuit and sensor. This ensures a temperature precision of ±0.3°C
- Rated power 10mW at 25°C



R (Ω) at 25°C	B-value 25°-85°C	Dissipation factor	Thermal Time constant(s)	Operating temp. range °C	Order code
1.0K ± 1%	3100K ± 1%	2	15	-50°C to +90°C	61-0500
2.0K ± 1%	3182K ± 1%	2	15	-50°C to +90°C	61-0505
5.0K ± 1%	3324K ± 1%	2	15	-50°C to +110°C	61-0510
10.0K ± 1%	3435K ± 1%	2	15	-50°C to +110°C	61-0515
20.0K ± 1%	4013K ± 1%	2	15	-50°C to +110°C	61-0520
50.0K ± 1%	4660K ± 1%	2	15	-50°C to +110°C	61-0525
100.0K ± 1%	4665K ± 1%	2	15	-50°C to +110°C	61-0530

Type	Order code	1+	25+	100+	200+
1.0K	61-0500	0.75	0.5824	0.4992	0.4368
2.0K	61-0505	0.75	0.5824	0.4992	0.4368
5.0K	61-0510	0.75	0.5824	0.4992	0.4368
10.0K	61-0515	0.75	0.5824	0.4992	0.4368
20.0K	61-0520	0.75	0.5824	0.4992	0.4368
50.0K	61-0525	0.273			
100.0K	61-0530	0.75	0.5824	0.4992	0.4368



### Ultra thin flexible NTC thermistors

These very flexible and ultra thin (just 0.5mm thick) thermistors feature a superior electrical insulation and high accuracy - ±1%.

- Their fast response makes them ideal for a wide range of applications
- Dissipation factor 0.7mW/°C
- Rated power at 25°C is 3.5mW
- Available in two common values with a choice of overall lengths



Technical specification	Resistance	B value	Operating temp	Length	Order code
103JT-025	10kΩ±1%	3435°K	-50 to 90°C	25mm	61-0430
103JT-050	10kΩ±1%	3435°K	-50 to 90°C	50mm	61-0432
104JT-025	100kΩ±1%	4390°K	-50 to 125°C	25mm	61-0434
104JT-050	100kΩ±1%	4390°K	-50 to 125°C	50mm	61-0436

Type	Order code	1+	25+	100+	200+
JT 10k Thermistor 25mm	61-0430	0.81	0.6448	0.5408	0.4784
JT 10k Thermistor 50mm	61-0432	0.92			
JT 100k Thermistor 25mm	61-0434	0.81	0.6448	0.5408	0.4784
JT 100k Thermistor 50mm	61-0436	0.92	0.728	0.6136	0.5408



### Glass encapsulated miniature thermistors

The miniature GT series feature a high quality thermistor element using alloyed technology for bonding to the lead wire and sealed in a glass coating.

- Fast response time
- High accuracy
- Wide temperature range
- Excellent moisture proof properties
- Lead length 45mm
- Dissipation factor is 0.6mW/°C
- Rated power at 25°C is 3mW



Technical specification	Resistance	B value	Temperature range	Order code
102GT-2	1kΩ	3305K ± 2%	-50 to +200°C	61-0440
202GT-2	2kΩ	3838K ± 2%	-50 to +300°C	61-0442
502GT-2	5kΩ	3964K ± 2%	-50 to +300°C	61-0444
103GT-2	10kΩ	4126K ± 2%	-50 to +300°C	61-0446
203GT-2	20kΩ	4282K ± 2%	-50 to +300°C	61-0448
503GT-2	50kΩ	4288K ± 2%	-50 to +300°C	61-0450
104GT-2	100kΩ	4267K ± 2%	-50 to +300°C	61-0452
204GT-2	200kΩ	4338K ± 2%	-50 to +300°C	61-0454
504GT-2	500kΩ	4562K ± 2%	-50 to +300°C	61-0456
105GT-2	1MΩ	4608K ± 2%	-50 to +300°C	61-0458

Type	Order code	1+	25+	100+	200+
GT series 1k	61-0440	0.92	0.728	0.6136	0.5408
GT series 2k	61-0442	0.92	0.728	0.6136	0.5408
GT series 5k	61-0444	0.92	0.728	0.6136	0.5408
GT series 10k	61-0446	0.92	0.728	0.6136	0.5408
GT series 20k	61-0448	0.92	0.728	0.6136	0.5408
GT series 50k	61-0450	0.92	0.728	0.6136	0.5408
GT series 100k	61-0452	0.92	0.728	0.6136	0.5408
GT series 200k	61-0454	0.92	0.728	0.6136	0.5408
GT series 500k	61-0456	0.92	0.728	0.6136	0.5408
GT series 1M	61-0458	0.92	0.728	0.6136	0.5408



### NTC Inrush limiters

NTC thermistors designed to limit current flow to a low value when equipment is first switched on.

- Protects against high inrush currents in power supplies, lighting circuits, motors, etc. and are ideal for general 'soft start' techniques
- Operating temperature -40°C to +170°C



Zero power resistance	Steady state current max.	Resistance approx. @ max. current	Thermal dissipation constant	Thermal time	Dia. (mm)	Width (mm)	Pitch (mm)	Order code
120Ω	1A	2.29Ω	14mW/°C	35s	10	5	5	26-7604
20Ω	2A	0.604Ω	16mW/°C	45s	10	5	5	26-7606
2.5Ω	5A	0.1Ω	13mW/°C	35s	10	5	5	26-7608
5Ω	5A	0.12Ω	13mW/°C	68s	13	6	7.5	26-7610

Type	Order code	1+	25+	100+	250+
120Ω 1A Limiter	26-7604	0.77	0.663	0.561	0.51
2.5Ω 5A Limiter	26-7608	0.77	0.663	0.561	0.51

www.rapidonline.com

## STM32 Discovery evaluation kit

ONLY £8.95



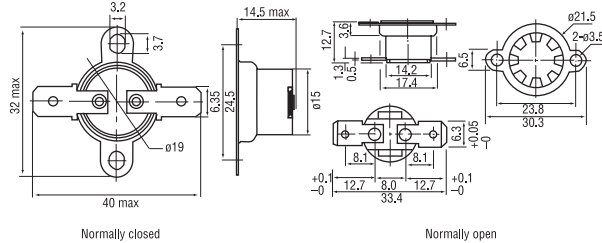
# Thermal sensors



## Thermal switches

A range of both normally closed (which open when switching temperature is reached) and normally open (which close when switching temperature is reached) board mounting thermal switches that are the ideal components in applications such as automatic temperature control and overheating protection.

- Auto-reset circuit breakers
- Operating tolerance  $\pm 5\%$
- Temperature range  $+60^\circ\text{C}$  to  $+160^\circ\text{C}$
- Temperature overshoot
- Dielectric strength 1500V AC/1 minute
- Input power 240V AC
- Contact endurance 30,000 cycles



Technical specification			
Type	Switching temperature	Temperature overshoot	Order code
Normally closed	$160^\circ\text{C}$	$5^\circ\text{C}$ to $10^\circ\text{C}/\text{minute}$	<b>26-7454</b>
Normally open	$160^\circ\text{C}$	$200\%^\circ\text{C}/5\text{ mins.}$	<b>26-7468</b>
Type	Order code	1+	
Thermal switch	$160^\circ\text{C}$	<b>26-7454</b>	0.75
Thermal switch	$160^\circ\text{C}$	<b>26-7468</b>	0.99

## MICROTHERM Auto reset thermal switches

A range of normally closed (opening on temperature rise), and normally open (closing on temperature rise) bi-metallic switches, which automatically reset within a close tolerance band.

- Contacts are isolated from the mounting base
- Connection is via  $1/4\text{in}$  (6.35 x 0.8mm) fast-on terminals
- Switches are mounted via two screws through a rotating collar to assist with installation
- **UL, CSA and VDE approved**



Technical specification			
Type	Rise	Reset	
	$\pm 3^\circ\text{C}$	$\pm 4^\circ\text{C}$	
Insulation resistance	$>1000\text{M}\Omega$ @ 500V DC		
Dielectric strength	1,500V AC for 1 minute		
Contact resistance	$<30\text{m}\Omega$		
Rating	240V 10A AC, 120V 15A AC resistive/inductive		
Operations	100,000,000 cycles		
Dimensions	21 x 31 x 13mm		
Fixing centres	24mm (M3 holes)		
Normally closed			
Opening temp	Closing temp	Order code	
$40^\circ\text{C}$	$25^\circ\text{C}$	<b>26-7404</b>	
$50^\circ\text{C}$	$35^\circ\text{C}$	<b>26-7406</b>	
$70^\circ\text{C}$	$55^\circ\text{C}$	<b>26-7414</b>	
$80^\circ\text{C}$	$65^\circ\text{C}$	<b>26-7416</b>	
$90^\circ\text{C}$	$75^\circ\text{C}$	<b>26-7418</b>	
$100^\circ\text{C}$	$85^\circ\text{C}$	<b>26-7420</b>	
Normally open			
Closing temp	Opening temp	Order code	
$40^\circ\text{C}$	$25^\circ\text{C}$	<b>26-7410</b>	
$50^\circ\text{C}$	$35^\circ\text{C}$	<b>26-7422</b>	
$60^\circ\text{C}$	$45^\circ\text{C}$	<b>26-7424</b>	
$70^\circ\text{C}$	$55^\circ\text{C}$	<b>26-7426</b>	
$90^\circ\text{C}$	$70^\circ\text{C}$	<b>26-7430</b>	

Type	Temp.	Order code	1+	25+	100+	250+
<b>Normally closed</b>						
Thermal switch	$40^\circ\text{C}$	<b>26-7404</b>	1.35	1.23	1.05	0.936
Thermal switch	$50^\circ\text{C}$	<b>26-7406</b>	1.35	1.23	1.05	0.936
Thermal switch	$70^\circ\text{C}$	<b>26-7414</b>	1.35	1.23	1.05	0.936
Thermal switch	$80^\circ\text{C}$	<b>26-7416</b>	1.35	1.23	1.05	0.936
Thermal switch	$90^\circ\text{C}$	<b>26-7418</b>	1.35	1.23	1.05	0.936
Thermal switch	$100^\circ\text{C}$	<b>26-7420</b>	1.35	1.23	1.05	0.936
<b>Normally open</b>						
Thermal switch	$40^\circ\text{C}$	<b>26-7410</b>	1.35	1.23	1.05	0.936
Thermal switch	$50^\circ\text{C}$	<b>26-7422</b>	1.40	1.25	1.09	0.9672
Thermal switch	$60^\circ\text{C}$	<b>26-7424</b>	1.35	1.23	1.05	0.936
Thermal switch	$70^\circ\text{C}$	<b>26-7426</b>	1.35	1.23	1.05	0.936
Thermal switch	$90^\circ\text{C}$	<b>26-7430</b>	1.40	1.25	1.09	0.988



## FC-P2D Series thermal protectors

These snap-action thermal protectors are designed to provide a cost effective solution in a range of motor, transformer and lighting applications such as: battery packs, lighting fixtures, electronic circuits, heaters and automotive.

The conductive bimetal construction where the bimetal carries the circuit current ensures maximum sensitivity under short circuit conditions.

- Snap-action design
- Quick break/quick make switching action
- Ultra compact design with high switching contact rating
- Heat resistant PBT plastic case
- Preset calibration temperature
- Suitable for vacuum impregnation processes
- Reset temperature approx 70% of response temperature
- Equipped with 2x 100mm 20AWG leads
- **Pepi FC-P2D series**



Technical specification			
Response temperature tolerance	$\pm 5^\circ\text{C}$		
Contact ratings	12A 24V DC 8A 250V AC		12A 125V AC

Calibration temp. ( $^\circ\text{C}$ )	Order code	1+	25+	100+	250+
50	<b>61-2074</b>	2.07	1.97	1.86	1.65
60	<b>61-2076</b>	2.07	1.97	1.86	1.65
70	<b>61-2078</b>	2.07	1.97	1.86	1.65
80	<b>61-2080</b>	2.07	1.97	1.86	1.65
90	<b>61-2082</b>	2.07	1.97	1.86	1.65
100	<b>61-2084</b>	2.07	1.97	1.86	1.65
110	<b>61-2086</b>	2.07	1.97	1.86	1.65
120	<b>61-2088</b>	2.07	1.97	1.86	1.65
130	<b>61-2090</b>	2.07	1.97	1.86	1.65

## MICROTHERM Bi-metallic thermal switches

A range of normally closed fully insulated thermal cut-outs.

- Suitable for over-temperature protection and temperature control in electrical and electronic equipment
- The bi-metal disc construction is fully insulated with an epoxy coating
- **Approved to VDE, UL, CSA, SEMKO and BEAB**



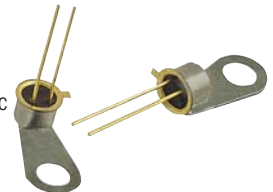
Technical specification			
Voltage rating	250V AC		
Current rating	resistive 2.5A cos = 1.0 inductive 1.6A cos = 0.6		
Temperature tolerance	$\pm 5^\circ\text{C}$		
Operating temperature	$-30^\circ\text{C}$ to $+180^\circ\text{C}$ where xyz is opening temperature		
Microtherm series	<b>T11V xyz 05U200</b>		
Dimensions	14.0(L) x 10.0(W) x 6.0(D)mm lead length 100mm		

Type	Order code	1+
$100^\circ\text{C}$	<b>26-5165</b>	1.40
$150^\circ\text{C}$	<b>26-5180</b>	1.46

## MICROTHERM Solid state MOXIE thermal sensors

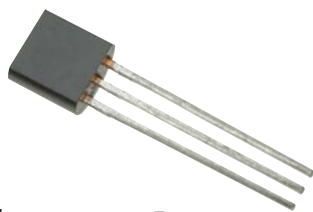
A range of solid state MOXIE thermal sensors which comprise an NTC thermistor with a highly specific transition region. When the sensor is heated the normally high resistance falls rapidly once the transition temperature has been reached (from about  $100\text{k}\Omega$  to  $100\Omega$  for a  $10^\circ\text{C}$  change in temperature). On cooling the device reverts back to the original high resistance with little hysteresis.

- Housed in a TO-18 package which is available in either vertical or horizontal tab mounting
- The devices are extremely sensitive
- High levels of reliability



Technical specification					
Transition temperature	Microtherm type	Order code	Microtherm type	Order code	
$57^\circ\text{C}$	B3 horizontal	<b>26-5020</b>	C3 vertical	<b>TS3-57-C3</b>	<b>26-5040</b>
$75^\circ\text{C}$	<b>TS3-75-B3</b>	<b>26-5025</b>	-	-	-
$85^\circ\text{C}$	<b>TS3-85-B3</b>	<b>26-5030</b>	<b>TS3-85-C3</b>	<b>26-5050</b>	

Type	Order code	1+	10+	50+	100+
$57^\circ\text{C}$ B3	<b>26-5020</b>	3.06	3.01	2.96	2.65
$75^\circ\text{C}$ B3	<b>26-5025</b>	3.06	3.01	2.96	2.65
$85^\circ\text{C}$ B3	<b>26-5030</b>	3.06	3.01	2.96	2.65
$57^\circ\text{C}$ C3	<b>26-5040</b>	2.42			
$85^\circ\text{C}$ C3	<b>26-5050</b>	4.15	3.69	3.43	2.91



## Temperature sensor ICs

### NEC/Schott SEFUSE thermal fuse

These thermal fuses use an organic thermosensitive pellet inside a metal case. They feature a large cutoff (rated) current of up to 15 A 250V AC. The devices contain a sliding contact, springs, and a thermal pellet inside a metal case. When the spring is compressed, firm contact between one lead and the sliding contact occurs. At normal temperatures, current flows from the lead to the sliding contact and then through the metal case to the other lead. When the ambient temperature rises to the SEFUSE operating temperature, the heat transferred through the metal case melts the thermal pellet. When the thermal pellet melts, two springs expand, moving the sliding contact away from the lead. The electrical circuit is opened by breaking contact between the sliding contact and the lead.

- Axial package - long lead type
- Rated current up to 15A 250V AC
- Rated to **UL, CSA, VDE, BEAB, CCC**

Mfrs. pt. no.	Rated functioning temp. (°C)	Operating temp. (°C)	Order code
SF70E-1	73	70 ±2	26-8000
SF96E-1	99	96 ±2	26-8002
SF119E-1	121	119 ±2	26-8004
SF139E-1	142	139 ±2	26-8006
SF169E-1	172	169 ±1-3	26-8008
SF184E-1	184	182 ±2	26-8010
SF226E-1	227	226 ±1-3	26-8012

Rated temp. (°C)	Part no.	Order code	1+	50+	100+	500+
73	SF70E-1	26-8000	0.41	0.3432	0.3016	0.26
99	SF96E-1	26-8002	0.41	0.3432	0.3016	0.26
121	SF119E-1	26-8004	0.41	0.3432	0.3016	0.26
142	SF139E-1	26-8006	0.41	0.3432	0.3016	0.26
172	SF169E-1	26-8008	0.41	0.3432	0.3016	0.26
184	SF184E-1	26-8010	0.41	0.3432	0.3016	0.26
227	SF226E-1	26-8012	0.41	0.3432	0.3016	0.26

### MICROTHERM Miniature thermal fuse



Non-resettable axial lead fuses, approved to **BEAB, VDE, SEMKO, FEMKO** and **UL** specifically designed to provide temperature protection on a wide range of appliances.

- The metal case of the fuse is not isolated from supply
- Dimensions 14.7(L) x 4.0(D); lead diameter 1.0mm

Rating	Breakdown	Opening temperature	Tolerance	Operating temp.	Manufacturers part number	Order code
10A 250V AC	1200V AC	0°C to -4°C	±2%	72°C	64A01072C	26-0850
40A	98°C				64A01098C	26-0860
Inductive 20A	167°C				64A01167C	26-0870
	184°C				64A01187C	26-0875
	228°C				64A01228C	26-0880

Type	Order code	1+	50+	100+	500+
72°C	26-0850	0.44	0.3848	0.3432	0.3016
98°C	26-0860	0.44	0.3848	0.3432	0.3016
167°C	26-0870	0.44	0.3848	0.3432	0.3016
184°C	26-0875	0.25			
228°C	26-0880	0.44	0.3848	0.3432	0.3016

### MICROTHERM Thermal fuses - Microtherm

Miniature, single-shot, radial lead non-resettable thermal fuses that have been designed to provide high temperature, fast protection on all domestic and industrial appliances, where their compact size (5.9 x 6.7 x 2.5mm) makes them ideal for high density mounting.

- Case completely isolated from either of the connecting leads
- Lead length 68mm, lead pitch 5.0mm
- Approved to **CSA, DENAN (AC250V), JEAML, UL** and **VDE**

Mfrs. pt. no.	Functioning temp. (°C)	Tolerance (°C)	Current rating @250V AC	Holding temp (°C)	Max. temp (°C)	Order code
TAMH0F-L 72	±3	2.5A	50	200		26-0942
TAMH1F-L 81	±2	2.5A	60	200		26-0956
TAMH2F-L 98	±3	3.0A	75	200		26-0930
TAMH3F-L 111	±2	3.0A	95	200		26-0936
TAMH4F-L 123	±2	3.0A	100	200		26-0940
TAMH5F-L 131	±2	3.0A	100	200		26-0946
TAMH6F-L 134	±2	2.5A	110	200		26-0948
TAMH7F-L 140	±2	2.0A	115	200		26-0950

Type	Order code	1+	25+	100+	500+
72°C	26-0942	0.19			
81°C	26-0956	0.19	0.1664	0.1248	0.104
98°C	26-0930	0.19	0.1664	0.1248	0.104
111°C	26-0936	0.19	0.1664	0.1248	0.104
123°C	26-0940	0.19	0.1664	0.1248	0.104
131°C	26-0946	0.19	0.1664	0.1248	0.104
134°C	26-0948	0.19	0.1664	0.1248	0.104
140°C	26-0950	0.19	0.1664	0.1248	0.104

## Tilt/tip-over switches



### Non-mercury tilt switch

A gas filled hermetically sealed tilt switch employing non toxic materials in a miniature completely mercury free sealed metal package.

- Normally open contacts which will close when tilted more than 10° from the horizontal
- Suited to a wide range of applications including toys, games, automotive and water treatment equipment
- **Assemtech type CW1300-1**

Type	Order code	1+	25+	100+	500+
Non-mercury tilt switch	78-0760	0.99	0.8736	0.7488	0.6552

Technical specification	Value
Contact arrangement	Single pole normally open
Contact rating	3VA max.
Switching current	0.25A max.
Switching voltage	60V AC or DC max.
Contact resistance	30Ω max. at 15° tilt
Temperature range	-40°C to +150°C



### Micro-miniature tilt switch

This micro-miniature tilt switch from Assemtech is probably the smallest metal cased, hermetically sealed tilt switch available today.

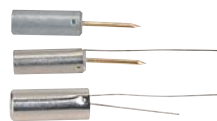
- Switch is gold plated inside and out to ensure good contact performance and ease of mounting
- Measures just 6.35 x 1.98mm (dia.)
- Ideal where size is a major element in design
- Suitable for high volume applications such as telecommunications, hand-held equipment etc. in security, medical, industrial markets etc.

Technical specification	Value
Contact form/style	non-mercury
Switch voltage	50V AC
Switching current	0.15A
Switching capacity	2.0VA
Contact resistance	30Ω max.
Operating temperature	-37°C to +125°C
Case material	Gold-plated steel
Differential angle	15° between open closed

Type	Order code	1+	10+	50+	100+
Micro-min. tilt switch	78-1026	2.69	2.49	2.34	2.28



### Non-mercury tilt switches



A range of economical, non-mercury tilt switches, which operate when tilted approximately 15° from the horizontal.

- Contact is made by gold-plated ball-bearings which roll onto the contact
- Three styles are available:
- **78-0752** has a single gold-plated pin, the case being the second contact and has a lead attached to the case
- **78-0754** has two nickel-plated leads

Technical specification	Value
Voltage range	1.2 to 14V
Rating	30mA to 1A
Life	100,000 operations
Contact resistance	0.04Ω @ 1.5V DC
Operating angle	15° from horizontal
Body dimensions:	
78-0752	12 x 4mm
78-0754	13 x 5mm

Type	Order code	1+	25+	100+	500+
Gold pin + lead	78-0752	0.64	0.5194	0.4664	0.3922
2 Nickel leads	78-0754	0.64	0.5194	0.4664	0.3922



### Compact non-mercury tilt switch

A very sensitive, compact non-mercury tilt switch that uses a gold plated contact ball and gold plated terminals for improved life and stability.

- The tilt switch is designed to trigger a suitable IC and is suitable for non-hazardous applications
- Requires suitable cut-out on PCB

Technical specification	Value
Contact	78-0762 Normally open 78-0970 changeover
Switching voltage	24V DC max
Switching current	25mA max
Operating angle	15° from horizontal
Contact resistance	200Ω max
Operating temperature	-25°C to +85°C
Case material	copper alloy, gold plated
Termination	copper alloy, gold plated pins
Dimensions	78-0762 8.6 x 4.0mm 78-0970 13.6 x 4.00mm

Type	Order code	1+	25+	100+	500+
Compact tilt switch NO	78-0762	0.72	0.624	0.4992	0.416
Compact tilt switch CO	78-0970	0.89	0.7488	0.5824	0.4784



### Low cost non-mercury tilt switches

Low cost PCB mounting non-mercury tilt switches fitted with gold contacts.

- Available with straight or right angle pins for direct mounting to a PCB
- Ideal low cost solution in alarm systems and general angle sensing
- Supplied in Polyamide 6,6 case with **UL 94V-0** rating
- **Assemtech types M1230-1** (vertical) and **M1230-2** (horizontal)

Technical specification	Value
Contact rating	25mA at 240V DC
Contact resistance	10 Ω
Differential angle	10°
Operating temperature	-25°C to +70°C

Type	Order code	1+	25+	100+	500+
Vertical tilt switch	78-1058	0.42	0.3536	0.3172	0.286
Horizontal tilt switch	78-1056	0.47	0.3952	0.3536	0.3172

Downloadable datasheets  
www.rapidonline.com



### Miniature non-mercury tip-over switch

A sensitive hermetically sealed tip-over switch with non-mercury contacts.

- Switch contacts are closed when switch is vertical and open when tilted in any other direction



Technical specification	
Contact arrangement	Normally closed
Switching capacity	3VA
Switching current	0.25A
Operating angle	25° ± 15°
Operating temperature	-37°C to +100°C
Case material	Steel tin plated

Type	Order code	1+	25+	100+	250+
CW1725-1	<b>78-1052</b>	4.58	4.06	3.74	3.33



### Moulded tip-over switch

A fully enclosed non-mercury tip-over switch fitted with a flanged base for easy fitting to equipment.

- Switch contacts are closed when switch is vertical and open when tilted in any other direction
- Fitted with 150mm flying leads for easy connection
- The housing is sealed to **IP65**
- **Assemble type TTS60/15**



Technical specification	
Switching capacity	3VA
Switching current	0.25A
Operating angle	40° to ±15°
Operating temperature	-20°C to +70°C
Case material	Polypropylene
Fixing centre	25 x 3.5mm dia.

Type	Order code	1+	10+	25+	100+
Tip-over switch	<b>78-1054</b>	8.11	7.49	6.95	6.45



### Mercury free tilt switch module

A robust, fully sealed tilt switch, manufactured using non-toxic materials in an ABS case. Switch operates when tilted from the horizontal position. Suitable for a wide range of applications.

- 15° differential angle
- Can be used for AC and DC applications (for DC voltages reduce AC rating to 70%)
- Fully sealed to give maximum mechanical protection and minimise the ingress of dust and moisture
- Ring terminals for secure connection
- Supplied with mounting clip
- **Assemble type S1016CW**



Technical specification	
Switching voltage (max.)	120V AC rms
Switching current (max.)	1A
Switching capacity (max.)	25VA
Contact resistance (max.)	3Ω
Differential angle (about horizontal)	15°
Operating temperature	-20°C to +70°C
Storage temperature	-25°C to +70°C
Cable/termination	2x 0.52mm round silicone rubber insulated. Tag hole 4.3mm dia.

Type	Order code	1+	25+	100+	500+
Tilt switch	<b>78-0772</b>	8.82	8.34	7.83	7.33



### Low cost compact tip-over switch

Offers a low cost solution to detecting tipover movement.

- Designed to trigger an I.C.
- Suitable for alarm and non-hazardous applications
- Gold plated contact ball
- Gold plated terminals for improved life and stability



Technical specification	
Contact form	Closed
Switching voltage	24V DC max.
Switching current	25mA max.
Operating angle	45 ± 15 from vertical
Contact resistance	10Ω
Operating temperature	-25°C to +70°C
Case material	Polyamide 6.6
Termination	Copper alloy, gold plated pins

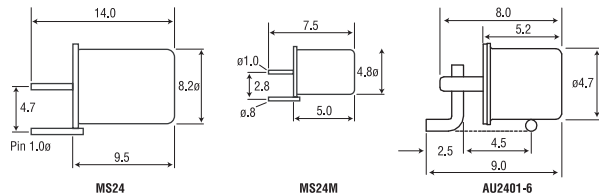
Type	Order code	1+
Tip-over switch	<b>78-2076</b>	0.52



### Non-mercury vibration sensors

This range of high sensitivity motion and vibration sensors have been designed to easily be used with both analogue and digital circuitry. When disturbed, the sensor reacts by a fleeting change of state of the switch contact. The time taken to settle depends on the amount of energy absorbed by the device.

- Manufactured using non-toxic materials
- Hermetically sealed
- Not position sensitive
- Available in through hole mounting version in two sizes as well as a surface mount version
- Low contact resistance makes these sensors ideal for incorporating into new or existing designs
- Gold plated steel case



Technical specification	<b>MS24</b>	<b>MS24M</b>	<b>AU2401-6</b>
Assemble type	MS24	MS24M	AU2401-6
Switching voltage V	24	24	24
Switching current (max.) mA	250	200	200
Switching capacity (max.) VA	5	5	5
Contact resistance Ω	2 initially	10 max.	10 max.
Operating temperature	-37°C to +100°C	-37°C to +100°C	-37°C to +100°C
Mounting type	Through hole	Through hole	Surface mount
Order code	<b>78-0767</b>	<b>78-0768</b>	<b>78-0769</b>

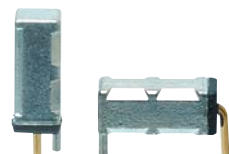
Type	Order code	1+	25+	100+	500+
MS24	<b>78-0767</b>	2.03	1.97	1.92	1.76
MS24M	<b>78-0768</b>	1.49	1.32	1.16	1.04
AU2401-6	<b>78-0769</b>	2.49	2.38	2.18	2.11



### Non mercury shock/movement sensor

This miniature shock/movement detector uses gold plated contact ball and gold plated terminals, and is suitable for alarm systems and non-hazardous applications etc.

- The sensor detects a shock or movement at a right-angle to its main body, and is sensitive to less than 1g
- The output is designed to trigger a suitable IC
- Available in vertical and horizontal mounting



Technical specification	<b>VBS010100</b>	<b>VBS010200</b>
Contact	NO	NO
Operating temperature	-25°C to +70°C	
Case material	Zinc alloy/GF Polyamide 6,6 UL94V-0	
Feature	Detects shock at right-angle to switch body	
Mounting	Vertical	Horizontal
Dimensions	12.5 x 5 x 5mm	

Type	Order code	1+	25+	100+	500+
VBS010100	<b>78-1020</b>	1.40	1.25	1.09	0.832
VBS010200	<b>78-1022</b>	1.30	1.14	0.988	0.884



### Linear acceleration switch

The switch is fitted with a spring loaded contact which closes when the switch detects shock or acceleration above stated activation levels. Contact will open again when activation levels decrease.

- Applications include impact sensing, automotive crash and motion systems
- Sealed contacts



Technical specification	<b>78-3770</b>	2 to 4.9
	<b>78-3772</b>	10 to 14.9
Contact form/style		Normally open
Switching voltage	V AC max.	24
Switching current	A max.	0.25
Switching capacity (resistive)	VA max.	5
Contact resistance	Ω max.	10
Case material		Steel - gold plated
Operating temperature	°C	-20°C to +85°C
Storage temperature	°C	-25°C to +90°C

Type	Order code	1+	10+	50+
Accel. sw. ASLS-5.0	<b>78-1495</b>	4.94	4.32	3.71
Accel. sw. ASLS-2	<b>78-3770</b>	4.94	4.32	3.71
Accel. sw. ASLS-10	<b>78-3772</b>	4.94	4.32	3.71

TruSens

Movement sensor

Switches with two contact balls for extra sensitivity to detect vibration.

- Both ideal for anti-tamper detection in security systems
- Operates in all positions although sensitivity may vary
- Circuit is normally closed but switches should be used in a change of state mode



Technical specification

	<b>78-2088</b> (Horizontal)	<b>78-2104</b> (Vertical)			
Contact form	Normally closed	Normally closed			
Contact rating	25mA at 25V DC	25mA at 25V DC			
Operating temperature	-25°C to +70°C	-25°C to +70°C			
Case material	Zinc alloy	Zinc alloy			
Termination	Gold plated over nickel	Gold plated over nickel			
Solderability	230 max. for 5s	230 max. for 5s			
Operating life	1,000,000 cycles	1,000,000 cycles			

Type	Order code	1+	25+	100+	500+
Sensor horizontal	<b>78-2088</b>	0.62	0.5616	0.5096	0.4576
Sensor vertical	<b>78-2104</b>	0.62	0.5616	0.5096	0.4576

TruSens

Pendulum switch

A very simple pendulum switch with mechanical contacts.

- This switch offers a cost-effective alternative to heavy duty mercury switches
- Fully approved to **CSA, VDE** and **UR** for use in domestic heaters and safety systems up to 15A at 240V AC



Technical specification

Contact form		normally closed
Switch rating		240V AC @ 15A
Operating angle	min. 15°	max. 60°
Contacts		mercury free
Connections		6.3 x 0.8mm spades
Operating temperature	-25°C to +150°C	

Type	Order code	1+
Pendulum switch	<b>78-1078</b>	1.91

Encoders

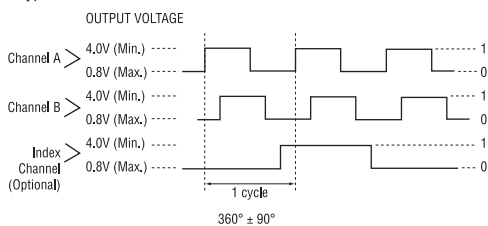


Rotary optical encoder 128 cycles per revolution

The **EN** model of encoder from **Bourns** is a self-contained, incremental, rotary optical device that produces a 2-bit quadrature signal output that is suitable for digital systems that require both magnitude and direction of adjustment data. The device converts rotary input into digital output signals that can be used directly, without the need for analogue to digital conversion. The output signals are 90° phase shifted square waves that do not require the debounce circuitry that a mechanical type of device requires. The benefits of these features make it possible to reduce component count, circuit complexity, cost and also to increase performance and reliability. Having a long life of 10,000,000 shaft revolutions and a compact, rugged body make this encoder suitable for use in extended service and limited space applications as a digital panel control or position sensing device.



- Two channel quadrature output
- Square wave signal
- Resolution 128 cycles per revolution
- CMOS and TTL compatible
- Long life
- Metal shaft and bushing
- **IP40** rating
- Bourns type **ENA1-B28-L00128L**



Technical specification

Electrical characteristics

Output signal	2-bit gray code with A leading B by 90° on clockwise rotation
Resolution	128 cycles per revolution
Insulation resistance	1000MΩ
Electrical travel	Continuous
Supply voltage	5V DC ±0.25V
Supply current max.	26mA
Output voltage (low) max.	0.8V
Output voltage (high) min.	4V
Output current (low) min.	25mA
Rise/fall time	200ns
Power consumption max.	136mW
Pulse width each channel	180° ±45°
Phase shift channel A to B	90° ±45°

Mechanical/environmental characteristics

Rotational life	10,000,000 revolutions
Vibration	5G
Shock	50G
Terminals	Axial PC pins
Weight	11g
Operating temperature range	-40°C to +75°C
Storage temperature range	-40°C to +85°C
Hardware	1x lockwasher, 1x mounting nut

Type	Order code	1+	10+	25+
Optical encoder	<b>61-1602</b>	34.27	30.11	29.32

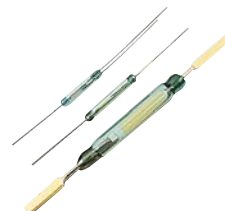
Proximity switches



Reed switches

A comprehensive range of rhodium contact miniature reed switches.

- Available in a variety of styles and contact ratings
- See **60-0560** for suitable magnets



Technical specification

Case code	A	B	C	D	Case code	A	B	C	D
1	36	10	2	0.4	4	54	14.2	2.3	0.6
1A	46	15	2.54	0.6	6	55	18.5	2.6	0.7
2	55	14	2.3	0.5	8	79	52	5.4	2.5
3	52	14	2.6	0.5					

A = Overall length  
B = Glass length  
C = Diameter  
D = Lead diameter

Type	Contacts	Case code	Contact rating (VA) max.	Switching current (A) max.	Switching voltage (V) AC max.	Pull in range (AT)	Order code
Micro.	SPST	1	1	0.1	24	15-20	<b>60-0520</b>
Submin.	SPST	2	10	0.5	100	20-25	<b>60-0522</b>
Submin.	SPDT	3	3	0.2	30	20-25	<b>60-0524</b>
Submin.	SPST	4	10	1	250	10-30	<b>60-0534</b>
Miniature	SPST	1A	10	0.5A	140	14-23	<b>60-0515</b>
Miniature	SPST	6	40	2	440	20-25	<b>60-0528</b>
Compact	SPST	8	120	3	1500	60-65	<b>60-0532</b>

Type	Order code	1+	25+	100+	500+
Micro SPST	<b>60-0520</b>	0.68	0.5928	0.4992	0.4472
Submin. SPST	<b>60-0522</b>	0.45	0.3744	0.3328	0.2964
Submin. SPDT	<b>60-0524</b>	2.13	1.75	1.56	1.38
Submin. SPST	<b>60-0534</b>	0.64	0.5928	0.5408	0.5096
Miniature SPST	<b>60-0515</b>	0.51	0.468	0.4056	0.3848
Miniature SPST	<b>60-0528</b>	1.04	0.936	0.78	0.676
Compact SPST	<b>60-0532</b>	2.34	2.01	1.71	1.51

TruSens

Dry contact rhodium reed switches

These low-cost, long-life glass sealed reed switches feature rhodium contacts.

- They have been designed to cover a wide range of demanding applications including: liquid level sensors, security systems, reed relays, proximity sensors, counting devices etc.
- Tested to one billion operations



Technical specification

	<b>GR100</b>	<b>GR560</b>	<b>GR501</b>
Length	20.3mm	14.2mm	12.7mm
Contact	NO	NO	NO
Contact rating	10VA	10VA	10VA
Switching current	1A	1A	0.5A
Carry current	1.5A	1.5A	1A
DC switching voltage	100V	100V	100V
AC switching voltage	150V rms	125V rms	100V rms
Breakdown voltage	250V DC	250V DC	200V DC
Contact resistance	100mΩ	100mΩ	150mΩ

Type	Order code	1+	25+	100+	500+
GR100 Reed switch	<b>78-1010</b>	0.80	0.6864	0.572	0.4805
GR560 Reed switch	<b>78-1012</b>	0.57	0.5096	0.4576	0.4056
GR501 Reed switch	<b>78-1014</b>	0.50	0.468	0.4368	0.4056



### Encapsulated reed switches

A range of low cost reed switches which have been encapsulated in compact ABS housings enabling easy PCB mounting.

- Rhodium contacts for low contact resistance
- Fully sealed to give maximum mechanical protection and minimise the ingress of dust and moisture, ideal for harsh environments
- See **60-0560** in this section for suitable activating magnets



Technical specification	60-0512	60-0518	60-0511	60-5050	60-0513
Order code	60-0512	60-0518	60-0511	60-5050	60-0513
Type	Normally open	Normally open	Normally open	Normally open	Changeover
Switching voltage (max.)	24V AC	140V AC	150V AC	470V AC	100V AC
Switching current (max.)	0.1A	0.5A	0.5A	0.5A	0.5A
Switching capacity (max.)	1VA	10VA	10VA	10VA	5VA
Contact resistance (max.)	200mΩ	120mΩ	150mΩ	150mΩ	150mΩ
Pitch (mm)	12	22	20	22	20
Dimensions (L x W x H) (mm)	15 x 3.2 x 3.2	25 x 3.7 x 3.7	23 x 4.2 x 4.2	25 x 3.7 x 3.7	
Mfr. type	PPS24	PPSRI-03A	PPS150	PPS470	PPS175C
Type	Order code	1+	25+	100+	500+
PPS24	60-0512	1.25	1.04	0.832	0.78
PPSRI-03A	60-0518	0.78	0.7176	0.676	0.6136
PPS150	60-0511	0.61	0.5616	0.5096	0.4888
PPS470	60-5050	0.93	0.7488	0.6968	0.6448
PPS175C	60-0513	1.34	1.14	1.03	0.988



### Miniature magnets

A range of miniature magnets to suit our range of reed switches.



Length x Width x Depth	Order code	1+	25+	100+	500+
12.7 x 3.2 x 1.6mm	60-0560	0.14	0.1272	0.0657	0.0456
19.0 x 3.2 x 3.2mm	60-0540	0.55	0.4368	0.3328	0.3016
28.0 x 4.8 x 4.8mm	60-0542	0.94	0.728	0.572	0.52
25.4 x 6.4 x 6.4mm	60-0544	1.61	1.25	1.02	0.9568



### Neodymium disc magnets

A range of disc magnets manufactured from Neodymium Iron Boron which is up to 5 times more powerful than Alnico.

- All magnets are nickel plated to reduce the onset of corrosion when used under normal circumstances
- Ideally suited to proximity switch triggering or biasing where space is at a premium



Technical specification	M1219-1	M1219-2	M1219-3	M1219-4	M1219-5	M1219-6	M1219-8	M1219-10	M1219-11
Distance at which magnets measure 1000 Gauss	0.6mm	1.0mm	1.6mm	2.0mm	3.8mm	3.0mm	3.0mm	3.0mm	3.5
Dimensions	3 x 1mm	3 x 2mm	4 x 3mm	6 x 2mm	10 x 5mm	6 x 5mm	6 x 4mm	22 x 2	9 x 5mm
Surface flux (Gauss)	1500	2500	3200	2500	3500	3500	3900	800	3500

Operating temperature 120°C max.

NB: M1219-4 has north seeking identified with a dimple

Type	Order code	1+	25+	100+	250+
M1219-1	78-1064	0.31	0.2496	0.2288	0.1872
M1219-2	78-1066	0.31	0.2496	0.2288	0.1872
M1219-3	78-1068	0.44	0.3328	0.2912	0.2496
M1219-4	78-1070	0.44	0.3328	0.2912	0.2496
M1219-5	78-1072	0.64	0.4992	0.4472	0.3952
M1219-6	78-3783	0.71	0.5512	0.5096	0.416
M1219-8	78-3784	0.71	0.5512	0.5096	0.416
M1219-10	78-3786	0.78	0.624	0.5616	0.468
M1219-11	78-3788	0.71	0.572	0.5096	0.3744

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### Proximity reed switch ABS cased

A compact proximity reed switch housed in an ABS epoxy resin enclosure.

- Available with either normal open or normal closed contacts when magnet is not present
- A matching magnet is available separately, please see below



Technical specification	78-0996	78-0998	78-1000		
Contact	NO	NC	magnet		
Switching voltage	100V AC	100V AC	-		
Switching current	0.5A	0.5A	-		
Switching capacity	10VA	10VA	-		
Contact resistance	200mΩ	200mΩ	-		
Switching distance	12-15mm	8-12mm	-		
Operating temperature	-20°C to +65°C	-20°C to +65°C	-		
Case material	ABS epoxy resin				
Lead length	300mm	300mm	-		
Type	Order code	1+	25+	50+	100+
ABS reed switch NO	78-0996	1.44	1.25	0.9984	0.8632
ABS reed switch NC	78-0998	4.11	3.54	2.85	2.50
ABS magnet	78-1000	1.02	0.8736	0.7072	0.572



### Low cost plastic proximity switch

The switches have a side exit cable and a snap-off flange, which offers flexibility in fitting by choosing to either use the two screw locating holes in the switch housing or the adhesive pad fitted to the switch body. If screws are used the adhesive strip can be left in place as a useful insulator against excessive shock or vibration.



- Fitted with 100V DC, 0.5A reed switch
- Fully encapsulated in a strong plastic case with 450mm twin cable
- Designed for simple control or security applications
- Offer high reliability

Technical specification	78-2070	78-2072			
Order code	78-2070	78-2072			
Contacts	A normally open	A normally open			
Switching voltage	100V AC	100V AC			
Switching current	0.5A	0.5A			
Contact resistance	0.15Ω	0.15Ω			
Switching distance	20mm	20mm			
Operating temperature	-25°C to +70°C				
Cable	PVC covered 17/0.16 O/D 1.6mm by 450mm				
Case material	White plastic				
Approvals	UL				
Type	Order code	1+	25+	100+	500+
Proximity sw - side	78-2070	1.54	1.38	1.25	1.12
Magnet - side entry	78-2092	1.02	0.9152	0.8216	0.7384
	78-2072	1.58	1.42	1.28	1.15
Magnet - rear entry	78-2094	0.98	0.884	0.7904	0.7176



### Proximity reed switch

This micro proximity reed switch has been designed to be as inconspicuous as possible. With a body of only 17mm and 4mm wide it will fit onto a flat surface with either the two locating holes or the supplied high strength adhesive strip.

- Operating distance of 10mm
- Usually used to close circuits
- Can be operated by a magnet or coil
- Powered by a low voltage circuit
- Low contact resistance
- Life exceeding 20 million operations



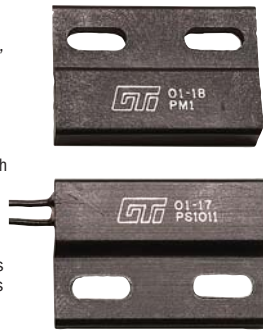
Technical specification	78-2074	78-2106			
Contacts	Normally open				
Switching voltage	24V AC/DC max.				
Switching current	0.1A max.				
Switching capacity	1W max.				
Contact resistance	0.15Ω				
Switching distance	10mm with specified magnet				
Operating temperature	-25°C to +70°C				
Storage temperature	-40°C to +75°C				
Case material	White plastic				
Cable	Twin core insulated				
Approvals	UL				
Type	Order code	1+	25+	100+	500+
Reed switch	78-2074	1.72	1.55	1.39	1.25
Magnet	78-2106	1.25	1.12	1.01	0.9048



Proximity sensor

This proximity sensor and matching magnet, provides the user with a cost effective combination of versatility and proven reed switch reliability.

- Moulded in black glass filled Nylon 6.6
- Design provides for three modes of operation: side-by-side, end-to-end or magnetic shunt
- Dimensions 28.5 x 19.5 x 6.4mm
- 5mm fixing slots on 16mm centres



Technical specification	
Contact arrangement	SPST
Contact ratings	Volts DC 100V Volts AC 250V Amps DC 1A Watts 15W DC
Breakdown voltage across contacts 800V DC min	
Initial contact resistance	0.15Ω
Operating temperature range	Magnet -30°C to +105°C Housing -30°C to +105°C Cable insulation -30°C to +70°C
Sensor/magnet gap	
	Side-by-side 10mm End-to-end 3mm Shunt 10mm

Type	Order code	1+	10+	25+
Proximity sensor	78-2012	2.76	2.44	2.18
Proximity magnet	78-2014	2.65	2.35	2.15



Miniature position sensor

A single-pole, single-throw, normally open, miniature position sensor that is reliable and robust.

- Suitable for dirty, oily, greasy, wet and similarly harsh environments
- When operated by a suitable magnet, the combination is suitable for direct magnet or shunt operation
- The reed switch is encapsulated in a moulded POCAN (PBT) housing and meets the needs for security and safety systems, office equipment and metering
- Fitted with 2x 0.5m of UL1007, 22AWG 7/0.2mm stranded cable with PVC insulation



Technical specification	
Contact configuration	SPST normally open
Maximum switching voltage AC	110V
Contact rating	0.25A
Max. switching load	5W
Dimensions (exclude cables)	20.3 x 3.7 x 14mm
Fixing hole	3.8mm dia.

Type	Order code	1+	25+	50+
Miniature position sensor	78-2002	2.29	2.18	1.98

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Active

Aluminium proximity switch

A robust proximity reed switch housed in a light weight aluminium sealed housing.

- Designed for use in control circuits and security systems etc.
- A matching magnet is available separately, please see below
- All fixing holes are countersunk for a neat finish when secured to a surface
- Termination is a twin 280mm long PVC insulated lead



Technical specification	
Contact	NO
Switching voltage	200V AC max
Switching current	0.5A max.
Switching capacity	10VA resistive
Contact resistance	300mΩ
Switching distance	10mm min.
Operating temperature	-20°C to +85°C
Case material	Aluminium
Dimensions	32mm x 15 x 8mm

Type	Order code	1+	25+	100+	500+
Aluminium proximity switch	78-1002	3.07	2.81	2.39	2.03
Magnet	78-1004	1.56	1.35	1.09	0.9152



Reed proximity switch

A range of magnetically operated reed proximity switches encapsulated in blue polystyrene housings.

- Supplied with 300mm flying leads
- Suited to a wide range of applications including intruder alarm systems
- Suitable for harsh operating environments
- Available in single pole and single pole changeover switching options
- An operating magnet is also available housed in an identical polystyrene housing

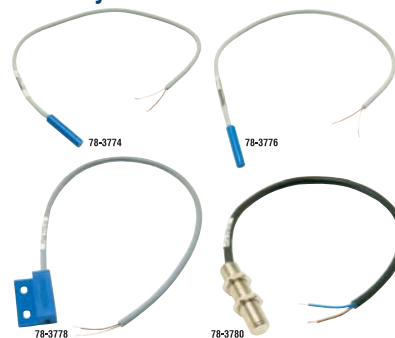


Technical specification		
Contact rating	SPNO 200V DC 250V AC	SPCO 175V DC 200V AC
Maximum load	10W	5W
Maximum switching current	0.5A	0.25A
Order code	78-0775	78-0780
Assemtech type	PSA240/30	PSC175/30
Magnet operating distance	8mm min.	
Dimensions	30 x 20 x 7mm	
Fixing centres	18mm	

Type	Order code	1+	25+	50+
SPNO Switch	78-0775	3.43	2.81	2.60
SPCO Switch	78-0780	3.53	3.28	3.11
Operating magnet	78-0785	2.50	1.97	1.75



Proximity reed switches



These reed switch based proximity switches are ideal for use in a wide range of applications, including: position and limit sensing, linear actuators, security systems, door switches.

- Available in cylindrical, rectangular or threaded types

- Normally open or normally closed contacts
- A magnet (PTM12) suitable for use with the threaded switch is available separately (see below)

Technical specification		
Mfrs. Pt. No.	PRA240/30	PRB130/30
Type	Cylindrical	Cylindrical
Contact form	Normally open	Normally closed
Switching capacity (resistive) max.	10VA	3VA
Switching voltage max.	40V AC	130V AC
Switching current max.	0.5A	0.25A
Carry current max.	1.0A	-
Breakdown voltage min.	600V DC	-
Contact resistance max.	150mΩ	200mΩ
Switching distance min.	5mm	3mm
Operating temperature range	-20°C to +85°C	-20°C to +85°C
Case material	Blue nylon 66	Polypropylene
Cable	2 x 0.14mm <sup>2</sup>	2 x 0.22mm <sup>2</sup>
Order code	78-3774	78-3776

Technical specification		
Mfrs. Pt. No.	PSB175/30	PTA230/30
Type	Rectangular	Threaded
Contact form	Normally closed	Normally open
Switching capacity (resistive) max.	5VA	60VA
Switching voltage max.	150V AC	230V AC
Switching current max.	0.5A	3.0A
Carry current max.	1.0A	4.0A
Breakdown voltage min.	200V DC	600V DC
Contact resistance max.	150mΩ	80mΩ
Switching distance min.	8mm	8mm
Operating temperature range	-20°C to +85°C	-20°C to +85°C
Case material	Blue nylon 66	Nickel plated brass
Cable	2 x 0.14mm <sup>2</sup>	2 x 0.50mm <sup>2</sup>
Order code	78-3778	78-3780

Type	Mfrs. pt. no.	Order code	1+	25+	100+	250+
Cylindrical sw.	PRA240/30	78-3774	3.63	3.33	2.81	
Cylindrical sw.	PRB130/30	78-3776	4.15	3.73	2.91	
Rect. sw.	PSB175/30	78-3778	4.88	4.37	3.54	
Threaded sw.	PTA230/30	78-3780	17.63	15.55	11.96	
Threaded magnet	PTM 12	78-3782	8.83	8.27	7.79	7.56



Proximity switch heavy casing

Heavy duty switch in a strong plastic housing.



- Extra powerful magnet in similar housing gives wide operating gap
- Slim line design and large operating gap makes this an easier switch to fit
- Magnet can be supplied in plastic housing identical in size to the switch housing

Technical specification	
Contact form	Form A normally open
Switching voltage	100V DC max.
Switching current	0.5A max.
Switching capacity	10W max.
Contact resistance	0.15Ω
Operating temperature	-25°C to +70°C
Case material	White plastic
Approvals	UL

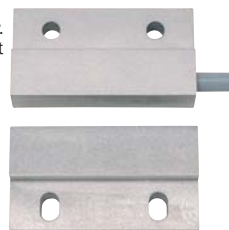
Type	Order code	1+	10+	25+	50+
Proximity Sw-Heavy Casing	78-2080	3.95	3.56	3.20	2.88
Magnet	78-2096	6.03	5.43	4.89	4.40



Aluminium proximity switches

A proximity reed switch with an aluminium body.

- Designed for the most demanding applications
- Single pole normally open contacts
- A matching operating magnet is available separately
- Fully sealed for maximum protection to IP65



Technical specification	
Assemtech code	PSAM240/30
Contacts	Normally open
Switching voltage	240V AC
Switching current	0.5A
Resistive switching capacity	10VA
Contact resistance	100mΩ
Switching distance	8.0mm
Operating temperature	-20°C to +85°C
Dimensions	35 x 20 x 8mm
Magnet	PSRM (order code 78-2060)

Type	Order code	1+	10+	50+	100+
PSAM 240/30 Switch	78-2052	7.01	6.76	6.55	6.40
PSRM Magnet	78-2060	6.84	6.14	5.45	4.87

### TruSens

#### Proximity switch

A compact proximity switch comprising a permanent magnet moulded into a flush housing and a single pole N/O reed switch moulded into a similar flush housing. Switch housing 26.5mm long, 8.5mm dia.

- With 280mm flying leads
- Magnet housing 26.5mm long, 8.5mm diameter
- Supplied as a set



Type	Order code	1+	25+	100+
Proximity switch	<b>78-0797</b>	0.99	0.9328	0.8904

### TruSens

#### Security proximity switch

Standard recessed proximity switch designed to be recessed into door or window frames.

- Sealed magnetic reed switch unit with 4 wire, 2 anti-tamper and matching magnet
- ABS housing suitable for wooden or aluminium frames
- 260mm flying leads
- Sold as a set



Type	Order code	1+	10+	25+	100+
Recessed ABS switch	<b>78-1670</b>	2.28	2.07	1.97	1.92

### ASSEMTECH EUROPE

#### Proximity switches

A hermetically sealed proximity switch housed in a round profile polystyrene case.

- Single pole changeover contact arrangement
- Ideally suited to position sensing and safety systems
- Fitted with a flying lead of overall length 300mm

A miniature actuating magnet with round profile is also available - see below.



Type	Order code	1+	25+	100+
175V SPCO switch	<b>78-0940</b>	2.96	2.70	2.44
Operating magnet	<b>78-0960</b>	0.47	0.416	0.364

### TruSens

#### Brass proximity switch

This brass proximity switch is strongly constructed and fitted with a long life reed switch.

- Designed for use in demanding applications such as control circuits and security systems
- Supplied with locking nut



A matching magnet is available - see below.

Type	Order code	1+	25+	100+	500+
Brass proximity switch	<b>78-0988</b>	3.80	3.28	2.86	2.44
Brass magnet	<b>78-0990</b>	1.82	1.56	1.30	1.04

### ASSEMTECH EUROPE

#### Sensolute micro vibration sensor omnidirectional

This sensor is used to detect very slight movements and vibrations using a 0.8mm micro sphere. The sphere bridges two contacts, reducing the resistance between the two contacts. The design of this sensor makes it ideal for use in converting systems to more environmentally friendly devices by utilising wake-up and power-down logic to reduce power consumption. Typical uses for this device include: front and rear bicycle lights, bike computers, remote controls, electronic lock systems, transponders, mobile GPS systems, bluetooth-car-kits, wireless sensor networks, wireless PC mice and headsets, digital multimeters and tools provided with digital displays that are only switched on when in motion.

- Fully automatically SMD-mountable
- Gilded sphere and contact areas
- Mercury-free
- Silent sphere motion
- Assemtech type **MVS 0608.02**



Technical specification	
R <sub>on</sub>	<100Ω
R <sub>off</sub>	>30MΩ
Response level approx.	50mV
Temperature range	-20°C to +70°C
Dimensions (L x W x H)	2.8 x 2.4 x 1.6mm

Type	Order code	1+	25+	100+	500+
Vibration sens. MVS0608.02S	<b>78-3790</b>	3.54	2.91	2.60	2.39

### Gentech

#### Proximity switch - threaded

A threaded, cylindrical proximity switch constructed from Nylon 6.6 and which is capable of multiple modes of operation. Suitable for door interlocks, hook switches, security systems, safety interlocks and position indication. Also available is a threaded, cylindrical magnet which is compatible with the switch to make an ideal combination for many applications.

- Switch and magnet provide an adjustable combination
- Move to target via lock nuts and through chassis mounting
- High repeatability
- Shunt or direct magnet operation
- Threaded barrel mounted M8 x 1.25mm pitch
- Normally open switch
- Overall length 38.2mm
- Fitted with two M8 lock nuts
- Gentech **PS811** (switch)/**Gentech PM81** (magnet)



Technical specification	
Contact form	Form A SPST
Contact material	Ruthenium
Switching volts max.	250V AC
Switching current max.	1A
Power max.	15W
Actuation method	Magnetic
Magnetic approach	End operate
Operate distance	3mm
Cable type	2 core, 1.5m length
Operating temperature	110°C
Mounting shock	50G for 11ms duration
Mounting vibration	35G up to 500Hz

Type	Order code	1+	25+	100+
Threaded prox. sw.	<b>61-1364</b>	3.21	2.95	2.49
Threaded magnet	<b>61-1366</b>	2.33	1.85	1.51

www.rapidonline.com

## SEFUSE thermal fuses



A wide range of C Axial thermal fuses

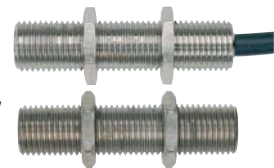
FROM **£0.25**

### ASSEMTECH EUROPE

#### High powered metal proximity switches

A high powered, brass-nickel plated proximity switch.

- The voltage rating is 1500V AC with switching current of 3A
- Supplied with two matching fixing nuts
- Fully sealed to give maximum mechanical protection and minimise the ingress of dust and moisture (to IP65)



Suitable magnet available separately - see below.

Technical specification	
Assemtech part	<b>78-2050</b>
Contacts	PTA 1500/30
Normally open	1500V AC
Switching voltage	3.0A
Switching current	120VA
Resistive switching capacity	80mΩ
Contact resistance	15.0mm min
Switching distance	< 20°C to +85°C >
Operating temperature	90mm x M18
Dimensions	PTM18 ( <b>78-2058</b> )
Matching magnet	

Type	Order code	1+	5+	10+	25+
PTA 1500/30 Switch	<b>78-2050</b>	18.51	17.56	15.37	14.14
PTM 18 Magnet	<b>78-2058</b>	15.07	14.04	13.47	13.20

## Photoelectric sensors

### SHARP

#### Optical distance sensors

Distance measuring sensor units that are available with analogue or digital outputs. The devices consist of a combination of position sensitive detector, infrared emitting diode and signal processing circuitry.



Device performance is further enhanced by using triangulation for sensing, so that variations in object reflectivity, ambient temperature and operating duration do not affect performance.

Suitable applications for these devices include: touchless switches, energy saving sensors and amusement machines.

- Can be used as a proximity sensor
- Choice of analogue or digital outputs
- Small footprint
- Sharp **GP2Y0** series

Technical specification	
Supply voltage	4.5V to 5.5V
Supply current max.	50mA
Measuring distance range	200mm to 1500mm (analogue)
	200mm to 800mm (digital)
Operating temperature	-10°C to +60°C

Type	Range	Order code	1+	25+
Analogue sensor	20-150cm	<b>58-0986</b>	9.89	9.08

### Nicera

#### Omnidirectional pyroelectric PIR sensor TO-5

An omnidirectional quad element PIR sensor, packaged in a TO-5 metal can.

- Balanced differential sensor
- Wide field of view in X and Y plane
- Nicera **RE-46B-P** type



Technical specification	
Operating voltage	3V to 10V DC
Source voltage	0.35V to 1.4V
Signal output typ.	5.5V p-p
Noise output typ.	110mV p-p
Balance output max.	15%
Frequency response	0.3Hz to 3Hz ±10dB
Field of view	132° from centre of element on axis X,Y
Field of view Y-axis	146° from centre of element on 45°
Operating temperature	-30°C to +70°C

Type	Order code	1+	25+	100+
PIR Sensor TO-5	<b>61-1468</b>	4.11	3.59	3.07

Nicera

General purpose pyroelectric PIR sensor TO-5

A general purpose dual element PIR sensor, packaged in a TO-5 metal can.

- Balanced differential sensor
- Wide field of view in X and Y plane
- Nicera RE-200B-P type



Technical specification	
Operating voltage	3V to 10V DC
Source voltage	0.3V to 1.5V
Signal output typ.	4V p-p
Noise output typ.	90mV p-p
Balance output max.	15%
Frequency response	0.3Hz to 3Hz ±10dB
Field of view X-axis	138°
Field of view Y-axis	125°
Operating temperature	-30°C to +70°C

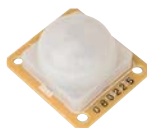
Type	Order code	1+	25+	100+
PIR Sensor TO-5	61-1466	2.39	2.13	1.61

Nicera

PIR Module with lens

This sensor module consists of a dual element PIR sensor, Fresnel lens and associated circuitry, mounted on a PCB. The module operates by detecting a change in detected infrared energy, from humans or other source.

- Wide detection area
- Nicera SGM5910-7-P type



Technical specification	
<b>Sensitivity</b>	
Install height	1m
Heat source differential	3° to 5° difference from background
Heat source moving speed	1m/s
Heat source movement direction	90°

<b>Characteristics</b>	
Operating voltage	4.75V to 10V
Breakdown voltage	12V DC
Supply current max.	2mA
Stability time max.	30s
Operating temperature	-20°C to +50°C

Type	Order code	1+
PIR Module with lens	61-1462	6.90

Matsushita Automation Controls

Passive infrared motion sensors

A range of highly compact PIR sensors housed in a TO5 package fitted with a zoned fresnel



lens. The sensor detects infra-red radiation in the low infrared spectrum (10µm wavelength) which is emitted by human movement. The sensors are able to detect a change in temperature from object to ambient from as little as 3°C. Changes in the level of detected emission are evaluated by a window comparator, and if the change exceeds the upper or lower threshold the output level of the sensor goes high and can be used to trigger external circuitry.

- Applications include burglar alarms, access control, automatic lighting, automatic door opening, and many other applications where detection of personnel is required
- Four types are available: a 10m long range type, a standard 5m detection range, a 5m spot type and a high sensitivity 2.5m detection range
- Matsushita AMN series

Technical specification	
Operating voltage	3 to 6VDC
Current consumption	170µA
Output current	100µA max.
Working temperature range	-20°C to +60°C

Type	Order code	1+	5+	10+
10m range black	61-1512	13.50		
10m range white	61-1514	14.72	14.25	13.83
5m range black	61-1500	15.59	14.82	13.41
5m range white	61-1502	14.34	13.47	12.69
5m range spot white	61-1510	13.94	13.47	13.00
2.5m range black	61-1504	14.51	14.34	14.03
2.5m range white	61-1506	14.51	14.04	12.90

Heavy duty footswitches (with guards)



A range of footswitches of 1 and 2 snap or slow action contact blocks

FROM £26.49

TruSens

KC7783R PIR Module

A low cost passive infrared module in a package measuring just 25 x 35mm. Features a ball lens with a viewing angle of 60° and a viewing range of 5m.

- High sensitivity
- Three-lead connection
- Designed for indoor use only
- Operating range -20°C to +50°C



Technical specification				
Operating voltage	Min	Typ	Max	Unit
Standby current (no load)	4.7	5	12	V
Output pulse width	0.5	300		µs
Output high voltage	5			V
Detection range	5			m

Type	Order code	1+	25+	100+
KC7783R PIR Module	61-1516	5.93	5.61	5.08



PIR Presence detector - flush mount, single channel

This flush mount PIR presence detector from Timeguard brings economy and flexibility to the home or workplace. Lights are activated only when they are needed, saving money and CO2 when areas are unoccupied. Ideal for energy saving installations in the workplace, corridors, offices, toilets etc., where light control can make all the difference.



It operates by turning the load on only when an area is occupied; after the occupant has left the area the load will automatically turn off. An integral, adjustable time delay ensures that the unit stays switched on, even when the occupant is momentarily still.

- Single channel surface ceiling mount
- Switches lights on when presence is detected and to light levels (LUX) set
- 360° circular detection, range up to 7m at 2.5m mounting height
- 3-user friendly adjustments for Time, LUX levels and Metre range
- Timer adjustment - continuous from 5 sec to 20 minutes (up to 30 or 60 minutes with IR10 remote)
- Lux adjustment - continuous from 10 to 2000 Lux
- Metre adjustment - approx (-) dia 1m to (+) dia 7m at 2.5m height
- Total switching: 2000W incandescent/halogen, 750W fluorescent/low energy
- Optional infra-red remote control for remote set-up and adjustment using part code IR-10
- Also gives extended lamp ON times
- LED indication on detection and on optional remote control set-up
- Side or bottom cable entry
- Timeguard PDFM361

Type	Order code	1+	5+	10+
PIR Flush mount	23-5451	36.75	34.65	32.55



360° Flush mount ceiling PIR presence detector

This 360° PIR is ideal for burglar alarm systems. Made by Timeguard this ceiling mount PIR ensures unparalleled catch performance.



It is adaptable and provides excellent all-round protection in a variety of applications - from a discrete flush mounted installation in a home, to office landings requiring additional protection. Other applications include stairways, or storage areas where movement of stock may block the view of corner-mounted detectors. The compact design is aesthetically pleasing and being flush mounted looks discrete as well as stylish.

- Flush mounting
- 360° ceiling flush mount PIR presence detector
- 6m diameter (3m radius) detection range at 2.5m mounting height
- No creep zone - maximum coverage
- Light ON time adjustable from 5 seconds to 18 minutes
- Manual On/Off override
- IP44 weatherproof rating (also suitable for outdoor use)
- Adjustable light level control
- Total PIR switching: 2000W (e.g. 20° 100W GLS) incandescent or halogen, 500W fluorescent/low energy
- Not suitable for discharge lighting
- 75W fan
- Part No. SLMF360

Type	Order code	1+	5+	10+
360° Flush detector	23-5452	22.58	21.53	19.95

TruOpto

Fresnel lens for pyroelectric PIR sensors

A spherical Fresnel lens that is suitable for use with PIR sensors.

- High accuracy performance using special Fresnel grooves technology
- Compact size
- Manufactured from high density polyethylene



Technical specification	
Detection zones	19
Field of view	±48°
Dimensions	23mm

Type	Order code	1+
Fresnel lens	61-1526	0.875

Nicera

Fresnel lens for PIR sensors

A spherical Fresnel lens that is suitable for use with PIR sensors.

- Manufactured from high density polyethylene



Technical specification	
Detection zones	17
Focal length	12.9mm
Field of view	±50° (horizontal), ±30° (vertical)
Dimensions	24 x 24mm

Type	Order code	1+	25+	100+
Fresnel lens for PIR	61-1528	1.66	1.40	1.09



Fast delivery

All orders received by 8pm - Monday to Friday are despatched the same day

### Kingbright

#### Sub-miniature photoreflective sensors

This compact, thin, high sensitivity photo reflective sensor is available with single transistor or Darlington transistor output.

- Supplied with either straight horizontal or 90° legs



Technical specification

	KTIR0A11S KTIR0B11S	KTIR0A21DS KTIR0B21DS
Output device	single transistor	Darlington
Peak emission wavelength	940nm	940nm
CTR min	0.5% 4mA (I F)	8% 4mA (I F)
Rise time	20µs	80µs
Fall time	20µs	70µs
Input forward current	50mA	50mA
Output collector current	20mA	20mA
Output VCEO	35V	35V
Output VECO	6V	6V
Pin configuration	straight legs	90° legs

Type	Order code	1+	25+	100+	500+
KTIR0A11S	58-0938	0.38	0.30	0.237	0.187
KTIR0A21DS	58-0940	0.56	0.4515	0.3675	0.3014
KTIR0B11S	58-0934	0.37	0.3045	0.2489	0.1964
KTIR0B21DS	58-0936	0.40	0.336	0.2625	0.2226

Electronic components

Sensors

### Matsushita Automation Controls

#### Cylindrical photoelectric sensors

A range of compact photoelectric sensors for detecting the presence of objects, for instance, in conveyor and parts feeding systems.



- The sensors are enclosed in M18 threaded housings, sealed to IP67 rating
- Objects are detected by light emitted from the sensor which outputs a signal to the control circuitry
- Two versions are available, with either NPN or PNP transistor outputs
- Diffuse: This type of sensor emits a constant beam of light which, when an object passes in front of the sensor, within 12cm is reflected back on to the sensor which outputs a control signal
- Retro-reflective: In this case emitted light is reflected back to the sensor by an optical reflector. When an object breaks the beam a control signal is output. The advantage of this type is that a longer detection distance can be achieved (up to 3.0m) at moderate cost. A suitable reflector is available separately
- **Matsushita C series**

Technical specification

Housing material	Plastic to IP67
Dimensions H x W x L	M18 x 56mm
Connection	Cable 2m
Operating voltage	10-30V DC ± 10%
Operating temperature	-25°C to +55°C
Weight	Approx. 100g (C200/2005 approx. 190g)

Matsushita type	C250	C230
Sensor type	Retro-reflective	Diffuse
Sensing distance	3m	12cm
Std. detectable object	Metal, matt black dia. ≥ 50m	White drawing paper 5 x 5cm
Detectable target	Opaque, semi transparent	Opaque transparent
Response time	2ms max.	2ms max.
Output transistor	100mA max.	100mA max.
Emitting diode	Infra red LED	Infra red LED

Type	Order code	1+	5+	10+
C250	NPN 61-1410	34.32	33.23	32.23
Reflector	61-1460	6.14	5.62	5.18
C230	NPN 61-1420	30.00	28.34	26.68

## Flow & pressure sensors

### Gentech

#### Flow switch - copper



A range of flow switches that are available in two flow rates. Sturdily constructed from 15mm copper pipe with reliable reed switch technology these units are easy to install and provide excellent performance making them suitable for a wide range of water or air flow switching applications. Ideal components for use in mains water control, leak detection, cooling systems, flow sensing, central heating systems, circulating pump protection and power showers.

- Minimal pressure drop
- Suitable for hot and cold potable water
- Operates from a small head of water
- Meets UL94-HB flammability rating
- **Gentech FS series**

Technical specification

Mounting	61-1358	Vertical ±15°
	61-1546	Horizontal or vertical
Material		Copper
Fitting		Flow switch 15mm pipe size
Contact form		Form A - SPST
Contact material		Ruthenium
Switching volts max.		300V DC
Switching current max.		1A
Power max.		15W
Cable type		2x 16/0.2mm PVC insulated, 1m length
Cable colour		Black/black
Operating temperature		85°C
Flow rate	61-1358	0.5l/m
	61-1546	3.0l/m
Operating pressure		10 Bar
Mounting shock		50G for 11ms duration
Mounting vibration		35G up to 500Hz

Type	Flow rate	Order code	1+	25+	100+
Flow switch	0.5l/m	61-1358	6.54	6.02	5.71
Flow switch	3.0l/m	61-1546	7.46	6.17	5.65

## Float switches

### Gentech

#### Compact float switches



Compact, economically priced float switches in horizontal and vertical mounting styles.

- Suitable for both high or low level sensing
- The switching element is a sealed reed relay which is actuated via a float-mounted magnet, which moves in relation to the liquid level in the vessel
- The horizontal switch is an external fitting type featuring rapid push fit installation and providing sealing up to 0.34 bar (5 psi)
- Switch operation can be normally open or normally closed by simply rotating the sensor through 180°
- The vertical mounting switch is an internal mounting type secured by an 'O' ring and M8 fixing nut
- Suitable for top or bottom tank mounting with the float rising or falling to actuate
- Both types are terminated in 10cm flying leads

Technical specification

Contact configuration	SPST	SPST
Max. current	1A	1A
Max. voltage	100V DC/250V AC	100V DC/250V AC
Contact rating	15W	15W
Material:	body float	Acetal copolymer Foamed polypropylene
Operating temperature	-30°C to +60°C	Polypropylene Foamed polypropylene -30°C to +70°C
Min. liquid S.G.	0.8	0.7
Overall length	85.5	59
Float diameter	15.5	30
Order code	61-1300	61-1305
Mfrs. type	LCS-01	VCS-02

Type	Order code	1+	25+	100+	250+
Horizontal	61-1300	4.78	4.05	3.28	3.07
Vertical	61-1305	4.78	4.05	3.28	3.07

### Gentech

#### Liquid level sensor - potable water



A side entry, horizontally mounted float switch type liquid level sensor that is manufactured in polypropylene and is suitable for potable water. Can be used for sensing rising or falling liquid levels (switch normally open or normally closed) simply by rotating mounting by 180°.

- External or internal fitting
- Easy installation
- Reliable reed switch operation
- Silicone sealing components
- Normally closed with float horizontal
- Typical applications include drinking water level, coolant level indication, cooling systems, high or low level water, waste water level
- **WRc** potable water approved
- **UL E98428** listed model
- **Gentech LS403-51**

Technical specification

Contact form	Form A SPST
Contact material	Ruthenium
Switching volts max.	250V AC
Switching current max.	1A
Power max.	15W
Cable type	2x 18AWG 32/0.2mm PVC insulated, 0.5m length
Cable colour	Black
Operating temperature	80°C
Minimum specific gravity	0.65
Operating pressure	4 Bar
Mounting shock	50G for 11ms duration
Mounting vibration	35G up to 500Hz

Type	Order code	1+	25+	100+
Liquid level sensor	61-1360	7.16	6.13	5.34

### Gentech

#### Liquid level sensor - fuel and oils



A side entry, horizontally mounted float switch type liquid level sensor that is manufactured in Nylon 6.6 and is suitable for fuels and oils. Can be used for sensing rising or falling liquid levels (switch normally open or normally closed) simply by rotating mounting by 180°.

- External or internal fitting
- Easy installation
- Reliable reed switch operation
- Silicone sealing components
- Normally closed with float horizontal
- Typical applications include level sensing of cooking oil, fuel, alcohol, sump level
- **UL E98428** listed model
- **Gentech LS303-51N**

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Technical specification	Form A SPST
Contact form	Ruthenium
Contact material	250V AC
Switching volts max.	1A
Switching current max.	15W
Power max.	2x 18AWG 32/0.2mm PVC insulated, 0.5m length
Cable type	Black
Cable colour	110°C
Operating temperature	0.85
Minimum specific gravity	4 Bar
Operating pressure	50G for 11ms duration
Mounting shock	35G up to 500Hz
Mounting vibration	

Type	Order code	1+	25+	100+
Liquid level sensor	<b>61-1362</b>	7.80	6.76	5.98



**Float switches**

A float switch suitable for vertical mounting and both falling or rising fluid levels.

- Consists of a sealed SPST reed switch and a float-mounted magnet, which actuates the reed switch depending on the level of liquid in the vessel
- Typical applications include high or low level sensing in reservoirs, overflow prevention, etc.
- Supplied with mounting kit permitting either internal or external fitting
- Terminated in 0.5m flying leads



Technical specification	SPST
Contact configuration	1A
Max. current	100V DC/120V AC
Max. voltage	15W
Contact rating	UL listed glass-filled polypropylene
Body material	-30°C to +110°C (continuous hot water 80°C max.)
Operating temperature	(non continuous hot water 100°C max.)
Min. liquid S.G.	0.65

Type	Order code	1+	25+	100+	500+
Humidity sensor	<b>61-0984</b>	0.56	0.53	0.49	0.47



**Liquid sensor**

This sensor has two gold plated metal probes fitted close to the body of the sensor. When the probes detect the presence of liquids the change in resistance will activate the internal reed switch contacts and cause the contact to close and the circuit to be made.

- Liquid drains away from the probes and resistance will drop and the switch contacts will open
- Liquids of very poor viscosity may not drain away from the probes and will cause the switch contacts to remain closed



Technical specification	Form A normally open
Contact form	100V DC max.
Switching voltage	0.5A max.
Switching current	10W max.
Switching capacity	0.5Ω
Contact resistance	-5°C to +80°C
Operating temperature	White plastic
Case material	Non corrosive. Not heavy oils
Liquids	Twin core insulated. 1.8m
Cable	

Type	Order code	1+	25+	100+	500+
Liquid sensor	<b>78-2090</b>	3.22	3.02	2.81	2.65

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**Environmental sensors**



**Humidity sensor**

A humidity sensor that will measure up to 90% RH. Suitable for use as a component in a wide range of end products such as: air conditioning systems, humidifiers/dehumidifiers, hygrometer and dataloggers.

- Packaged in a 2-pin in-line package
- Dimensions 15 x 9 x 4mm (body), lead spacing 2.54mm



Technical specification	1V rms
Rated voltage	0.2mA
Rated current	0.5 to 2kHz
Operating frequency range	0°C to +60°C
Operating temperature range	90% RH
Operating humidity range	14.2 to 38.5kΩ
Impedance range @ 60% RH 25°C	-5 to +5% RH
Humidity accuracy	2% RH
Hysteresis @ 40 to 80% RH	0.6% RH/°C
Temperature dependence (ref.)	

Type	Order code	1+	25+	100+	500+
Humidity sensor	<b>61-0984</b>	0.56	0.53	0.49	0.47



**Resistive humidity sensor**

A miniature sensor consisting of a RH sensitive material deposited on a ceramic substrate. The AC resistance (impedance) of the sensor decreases as relative humidity increases.

- High sensitivity and reliability in a small package
- Fast response time
- High resistance to chemicals and contaminants
- Enclosed in a moulded, cream coloured body
- 5mm pitch terminations



Technical specification	RH %	Value kΩ
AC resistance value 25°C	30	920
	40	220
	50	66
	60	23
	70	9.6
	80	4.2
	90	1.9

Humidity range	30 to 90% RH
Rated voltage	1.4 V AC pk
Rated power	0.26 mW pk
Frequency range	50Hz to 1kHz
Accuracy	±3% RH 60% RH, 25°C
Hysteresis	-3% RH 40-80% RH
Temperature dependence	0.5% RH/°C
Response time	60s
Operating temperature	0°C to +60°C
Dimensions H x W x D (mm)	18.6 x 14 x 6

Type	Order code	1+	10+	25+	50+
Humidity sensor	<b>61-0985</b>	2.76	2.55	2.13	1.92



**Humidity sensor - BC Components**

A humidity sensor which operates on a capacitance change with change in relative humidity.



Technical specification	10% to 90% RH
Humidity range	122pF ± 15%
Capacitance @ 25°C, 43% RH, 100 kHz	0.4pF/% RH
Typical sensitivity	1kHz to 1MHz
Frequency range	15V AC/DC max.
Supply voltage	<b>2322-691-90001</b>
Mfrs. pt. no.	

Type	Order code	1+	10+	25+
Humidity sensor	<b>61-0960</b>	10.24	8.74	7.54

**Optical proximity**



**Distance measuring sensor digital output**

Distance measuring sensors that are available in a choice of measuring ranges. Each device consists of a position sensitive detector, an infrared LED and associated signal processing circuitry. The output from the device is a 1-bit digital output that is proportional to the measured distance.



- Choice of measuring range 4 to 30cm or 10 to 80cm
- Lens made from visible light cut-off acrylic resin
- Wide supply voltage range
- Sharp GP2D15 series

Technical specification	Supply voltage max. range	-0.3 to +7V
	Operating supply voltage range	4.5 to 5.5V
	Supply current	33mA
	Output terminal voltage high min.	0.3V
	Output terminal voltage low max.	0.6V
	Operating temperature	-10°C to +60°C

Type	Range	Order code	1+	25+
Distance sensor	4 to 30cm	<b>58-0980</b>	9.10	8.27
Distance sensor	10 to 80cm	<b>58-0982</b>	7.75	5.80

**Miscellaneous**



**Strain gauges**

A pair of general purpose foil material polyester backed strain gauges.

- Type 11 (red colour) is temperature compensated for use with steel and type 23 (blue colour) is compensated for aluminium
- Supplied fitted with 30mm flying leads and two self adhesive terminal pads to facilitate connection to the gauge without the risk of damage caused by applying undue heat or mechanical stress



Technical specification	Gauge dimensions	08 x 2.0mm
	Package dimensions	13 x 4.0mm
	Gauge resistance	120Ω ±0.5%
	Gauge factor	2.1 ±1% (temp. coeff. <math>-5/100^{\circ}\text{C}</math>)
	Fatigue	>10 <sup>6</sup> reversals at 1000μ strain
	Foil material	Copper nickel alloy
	Base material	Polyester
	Linear expansion factor	Type 11 mild steel 10.8 x 10 <sup>-6</sup> /°C Type 23 aluminium 23.4 x 10 <sup>-6</sup> /°C

Type	Order code	1+	10+
11 mild steel	<b>78-1105</b>	3.94	3.63
23 aluminium	<b>78-1110</b>	3.94	3.63



**Ultrasonic transducers**

An ultrasonic transmitter and high sensitivity receiver.

- Designed for sending and receiving continuous or modulated waves in the 40kHz region through air
- Applications include remote control, data transmission, etc.
- These units are not watertight



Technical specification	Transmitter	Receiver
Sensitivity	106dB	-65dB
Resonant frequency	40kHz ± 1kHz	
Directional angle	Approx. 20°	
Max. input voltage	20V rms	
Impedance	500Ω	30KΩ
Capacitance		1100pF ± 20%

Type	Order code	1+	25+	100+
Receiver	<b>35-0175</b>	1.59	1.33	1.05
Transmitter	<b>35-0180</b>	1.59	1.33	1.05

**Nicera**  
**Ultrasonic transducer**

An open aperture type ultrasonic transducer that uses piezo ceramic elements that are capable of transmitting and receiving ultrasound. When driven by an alternating voltage of suitable frequency, the piezo ceramic element distorts in proportion to the applied voltage, generating ultrasonic waves. Conversely, the element will generate a voltage with an intensity proportional to the detected ultrasonic wave.



The device is suitable for volumetric security applications in the home and for automotive applications.

- Constructed with unimorph piezoelectric header and radial cone
- High sensitivity and sound level
- Excellent durability
- Extremely stable
- Suitable for air medium and continuous pulse driving
- Housing size  $\phi 16.2\text{mm}$

Technical specification  
Center frequency 40kHz  
Sensitivity >-58dB  
-6dB Directivity typ. 55°

Type	Order code	1+	25+	100+
Ultrasonic transducer	<b>61-1520</b>	6.76	6.14	5.15

**RVFM**  
**Sealed ultrasonic transducers**

A pair of standard 18mm diameter Tx/Rx 40kHz ultrasonic transducers sealed for external use.



- Supplied in a metal housing and sealed in with a resin to protect from the environment
- Rugged and moisture proof transducers feature high sensitivity and sound pressure level
- Excellent temperature and humidity durability
- Suitable for a wide range of applications such as remote control devices, robotics, intrusion alarms, energy saving equipment etc.

Type	Order code	1+	25+	100+
Sealed ultrasonic Tx	<b>35-0182</b>	3.91		
Sealed ultrasonic Rx	<b>35-0184</b>	3.91	3.31	2.73

**RVFM**  
**Ultrasonic range finder SRF05**

The **SRF05** is a new design of ultrasonic range finder and features an extended detection range. Two operational modes are available, single pin for trig/echo or 2-pin for compatibility with the **SRF04**.



The input trigger is a 10 $\mu\text{s}$  min. TTL level pulse and the echo pulse is a positive TTL level signal, with the width proportional to the object range.

- Based around a PIC processor
- Only requires a single 5V DC power supply
- Typical current consumption of 30mA
- Maximum range is a long 4m
- New design minimises pin usage host controller
- Ideal for low cost robotic applications

Technical specification  
Voltage requirement 5V DC  
Current typical 4mA

Frequency 40kHz  
Range max. 4m  
min. 1cm  
Input trigger 10 $\mu\text{s}$  min. TTL level pulse  
Echo pulse Positive TTL level signal, width proportional range  
Dimensions 43 x 20 x 17mm

Type	Order code	1+	3+	6+
Ultrasonic range finder	<b>78-1085</b>	13.99	13.47	12.43

**Nicera**  
**Pyroelectric PIR sensor unit**

This PIR module works on the pyroelectric principle, where a change in detected temperature produces an increase or decrease in generated electric potential.



The module consists of a quad element passive infrared sensor, a lens and associated circuitry, mounted on a PCB.

Having a wide field of view in the horizontal and vertical planes as well as 12 detection zones make this module suitable for a wide range of applications.

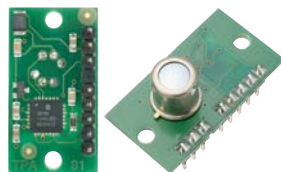
- Designed for human body detection
- High density polyethylene lens
- Wide field of view 97.7° in both planes
- An associated connecting cable assembly is also available (see price panel)
- **Nicera PSUP43-12** type

Technical specification  
Supply voltage 5V  $\pm$  0.25V  
Current consumption max. 3mA  
Output voltage (detection) +Vs - 0.5V  
Waiting time max. 50s  
Detection zones 12  
Field of view 97.7°C in horizontal and vertical planes  
Sensor type Balanced differential  
Dimensions (mm) 34.7 x 20

Type	Order code	1+	25+	100+
PIR sensor unit	<b>61-1464</b>	10.35	9.10	6.85
Cable assembly	<b>61-1465</b>	0.45	0.4056	0.3848

**Devantech**  
**TPA81 Thermopile array sensor**

This innovative sensor can detect infrared radiation in the 2 $\mu\text{m}$  to 22 $\mu\text{m}$  range (the range of radiant heat).



The device consists of a PCB on which is an array of eight thermopiles (thermocouples connected in series), together with a silicon lens and associated electronics. The sensor can simultaneously measure the temperature of eight adjacent points, as well as controlling a servo. When used in a relevant robotic application, servo control will enable a thermal image to be built up over a wide field of view.

- Suitable for many applications include robotics and security
- Detects body heat
- Will detect a candle flame at 2m
- Unaffected by ambient light
- Only requires 5V supply
- All communications by I2C bus via standard I2C 5-pin connector

Technical specification  
Input voltage 5V  
Current typ. 5mA (excluding servo)  
Temperature range +4°C to +100°C  
Accuracy (full FOV)  $\pm 3^\circ\text{C}$  (+4°C to +10°C)  
 $\pm 2^\circ\text{C} \pm 2\%$  (+10°C to +100°C)  
Field of view 41° x 6° (8 pixels of approx. 5° x 6°)  
Outputs 1 ambient + 8x pixel temperatures  
Servo Controls servo in 32 steps to 180° rotation  
Dimensions 31 x 18mm

Type	Order code	1+
TPA81 Thermal sensor	<b>78-0792</b>	51.95

**TruSens**  
**High performance ultrasonic range finder SRF08**

A high performance ultrasonic range finder with a range from 3cm to 6m.



- Typical current consumption of just 15mA
- Features a digital pot to vary the gain as the range increases
- This gets over the problem of cross coupling between transmit and receive transducers, which can cause op-amp saturation at close range
- The SRF08 does not use the host processor to time the returning echo. All timing is performed by the module
- Additionally, the module can cope with multiple echoes, as a buffer can store up to 16 echoes. This allows the module to 'see' through doorways, where a standard type would just see the door frame
- A I<sup>2</sup>C bus is used for communications, and a light sensor is included which is also readable over the I<sup>2</sup>C bus

Technical specification  
Voltage requirement 5V DC  
Current typical 15mA  
standby 3mA  
Frequency 40kHz  
Range max. 6m  
min. 3cm  
Max analogue gain variable 94 to 1025 in 32 steps  
Connection standard I<sup>2</sup>C Bus  
Light sensor front facing  
Timing fully timed echo, freeing host control  
Echo multiple echo - keeps looking after first echo  
Units range reported in  $\mu\text{s}$ , mm or inches  
Dimensions 43 x 20 x 17mm

Type	Order code	1+	3+	6+
SRF08 Range finder	<b>78-1086</b>	26.99	25.58	24.34

**TruSens**  
**CMPS03 Magnetic compass**

A compass module that is intended for robotic applications as an aid to navigation, but suitable for similar applications.



- Produces a unique number to represent an orientational direction
- Two Philips KMZ512 magnetic field sensors (which are sensitive enough to detect the Earth's magnetic field) are mounted at right angles to compute the direction of the horizontal component of the Earth's magnetic field
- The output bearing can be obtained from a PWM signal on pin 4 or via the I<sup>2</sup>C bus on pins 2 and 3
- The PWM signal is a pulse width modulated signal with the positive width of the pulse representing the angle
- The pulse width varies from 1ms (0°) to 36.99ms (359.9°) - that is 100 $\mu\text{s}/^\circ$  with a +1ms offset

Technical specification  
Voltage requirements 5V DC  
Current 20mA typical  
Resolution 0.1°  
Accuracy 3-4° approx, after calibration  
Output 1 Timing pulse 1ms to 37ms in 0.1ms increments  
Output 2 I<sup>2</sup>C interface, 0-255 and 0-3599, SCL speed up to 1MHz  
Dimensions 32 x 35mm

Type	Order code	1+	3+	6+
CMPS03 Compass	<b>78-1088</b>	24.65	22.83	21.79

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**6A Rectifier diodes - P600**



A range of silicon rectifier diodes housed in an R-6 plastic package to **UL 94V-0**

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